# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.4

## Control Rod Position Indication

## RETYPED PROPOSED IMPROVED TECHNICAL SPECIFICATIONS (ITS) AND BASES

## 3.9 REFUELING OPERATIONS

### 3.9.4 Control Rod Position Indication

LCO 3.9.4 The control rod "full-in" position indication channel for each control rod shall be OPERABLE.

APPLICABILITY: MODE 5.

ACTIONS

------------------------------------NOTE------------------------------------
Separate Condition entry is allowed for each required channel.
----------------------------------------------------------------------------

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more required control rod position indication channels inoperable. | A.1.1 Suspend in-vessel fuel movement. | Immediately |
| | <u>AND</u> | |
| | A.1.2 Suspend control rod withdrawal. | Immediately |
| | <u>AND</u> | |
| | A.1.3 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies. | Immediately |
| | <u>OR</u> | |
| | | (continued) |

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. (continued) | A.2.1 Initiate action to fully insert the control rod associated with the inoperable position indicator. | Immediately |
| | <u>AND</u> | |
| | A.2.2 Initiate action to disarm the control rod drive associated with the fully inserted control rod. | Immediately |

SURVEILLANCE REQUIREMENT

| SURVEILLANCE | FREQUENCY |
|---|---|
| SR 3.9.4.1 Verify the required channel has no "full-in" indication on each control rod that is not "full-in." | Each time the control rod is withdrawn from the "full-in" position |

# B 3.9 REFUELING OPERATIONS

## B 3.9.4 Control Rod Position Indication

BASES

### BACKGROUND

The full-in position indication channel for each control rod provides necessary information to the refueling interlocks to prevent inadvertent criticalities during refueling operations. During refueling, the refueling interlocks (LCO 3.9.1, "Refueling Equipment Interlocks" and LCO 3.9.2, "Refuel Position One-Rod-Out Interlock") use the full-in position indication channel to limit the operation of the refueling equipment and the movement of the control rods. The absence of the full-in position channel signal for any control rod removes the all-rods-in permissive for the refueling equipment interlocks and prevents fuel loading. Also, this condition causes the refuel position one-rod-out interlock to not allow the withdrawal of any other control rod.

UFSAR, Section 16.6, requires that one of the two required independent reactivity control systems be capable of holding the reactor core subcritical under cold conditions (Ref. 1). The control rods serve as the system capable of maintaining the reactor subcritical in cold conditions.

### APPLICABLE SAFETY ANALYSES

Prevention and mitigation of prompt reactivity excursions during refueling are provided by the refueling interlocks (LCO 3.9.1 and LCO 3.9.2), the SDM (LCO 3.1.1, "SHUTDOWN MARGIN (SDM)"), the intermediate range monitor neutron flux scram (LCO 3.3.1.1, "Reactor Protection System (RPS) Instrumentation"), and the control rod block instrumentation (LCO 3.3.2.1, "Control Rod Block Instrumentation").

The safety analysis for the control rod withdrawal error during refueling (Ref. 2) assumes the functioning of the refueling interlocks and adequate SDM. The analysis for the fuel assembly insertion error (Ref. 3) assumes all control rods are fully inserted. The full-in position indication channel is required to be OPERABLE so that the refueling interlocks can ensure that fuel cannot be loaded with any control rod withdrawn and that no more than one control rod can be withdrawn at a time.

(continued)

BASES

| | |
|---|---|
| APPLICABLE SAFETY ANALYSES (continued) | Control rod position indication satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii) (Ref. 4). |
| LCO | Each control rod full-in position indication channel must be OPERABLE to provide the required input to the refueling interlocks. A channel is OPERABLE if it provides correct position indication to the refueling interlock logic. |
| APPLICABILITY | During MODE 5, the control rods must have OPERABLE full-in position indication channels to ensure the applicable refueling interlocks will be OPERABLE.<br><br>In MODES 1 and 2, requirements for control rod position are specified in LCO 3.1.3, "Control Rod OPERABILITY." In MODES 3 and 4, with the reactor mode switch in the shutdown position, a control rod block (LCO 3.3.2.1) ensures all control rods are inserted, thereby preventing criticality during shutdown conditions. |
| ACTIONS | A Note has been provided to modify the ACTIONS related to control rod position indication channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition, discovered to be inoperable or not within limits, will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable control rod position indication channels provide appropriate compensatory measures for separate inoperable channels. As such, this Note has been provided, which allows separate Condition entry for each inoperable required control rod position indication channel. |

(continued)

BASES

ACTIONS (continued)

A.1.1, A.1.2, A.1.3, A.2.1 and A.2.2

With one or more required full-in position indication channels inoperable, compensating actions must be taken to protect against potential reactivity excursions from fuel assembly insertions or control rod withdrawals. This may be accomplished by immediately suspending in-vessel fuel movement and control rod withdrawal, and immediately initiating action to fully insert all insertable control rods in core cells containing one or more fuel assemblies. Actions must continue until all insertable control rods in core cells containing one or more fuel assemblies are fully inserted. Control rods in core cells containing no fuel assemblies do not affect the reactivity of the core and, therefore, do not have to be inserted. Suspension of in-vessel fuel movements and control rod withdrawal shall not preclude moving a component to a safe position.

Alternatively, actions must be immediately initiated to fully insert the control rod(s) associated with the inoperable full-in position indicator(s) and disarm (electrically or hydraulically) the drive(s) to ensure that the control rod is not withdrawn. A control rod can be hydraulically disarmed by closing the drive water and exhaust water valves. A control rod can be electrically disarmed by removing the four amphenol type plug connectors from the drive insert and withdrawal solenoids. Actions must continue until all associated control rods are fully inserted and drives are disarmed. Under these conditions (control rod fully inserted and disarmed), an inoperable full-in channel may be bypassed to allow refueling operations to proceed. An alternate method must be used to ensure the control rod is fully inserted (e.g., use the "00" notch position indication).

SURVEILLANCE REQUIREMENTS

SR 3.9.4.1

The full-in position indication channels provide input to the one-rod-out interlock and other refueling interlocks that require an all-rods-in permissive. The interlocks are actuated when the full-in position indication for any control rod is not present, since this indicates that all rods are not fully inserted. Therefore, testing of the

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.4.1 (continued)

full-in position indication channels is performed to ensure that when a control rod is withdrawn, the full-in position indication is not present. Note that failure to indicate full-in when the control rod is not withdrawn results in conservative actuation of the one-rod-out interlock, and therefore, is not explicitly required to be verified by this SR. The full-in position indication channel is considered inoperable even with the control rod fully inserted, if it would continue to indicate full-in with the control rod withdrawn. Performing the SR each time a control rod is withdrawn is considered adequate because of the procedural controls on control rod withdrawals and the visual indications and alarms available in the control room to alert the operator to control rods not fully inserted.

BWROG-ED-4

REFERENCES

1. UFSAR, Section 16.6.
2. UFSAR, Section 14.5.4.3.
3. UFSAR, Section 14.5.4.4.
4. 10 CFR 50.36(c)(2)(ii).

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.5

## Control Rod OPERABILITY Refueling

MARKUP OF CURRENT TECHNICAL SPECIFICATIONS (CTS)

DISCUSSION OF CHANGES (DOCs) TO THE CTS

NO SIGNIFICANT HAZARDS CONSIDERATION (NSHC) FOR LESS RESTRICTIVE CHANGES

MARKUP OF NUREG-1433, REVISION 1, SPECIFICATION

JUSTIFICATION FOR DIFFERENCES (JFDs) FROM NUREG-1433, REVISION 1
MARKUP OF NUREG-1433, REVISION 1, BASES

JUSTIFICATION FOR DIFFERENCES (JFDs) FROM NUREG-1433, REVISION 1, BASES

RETYPED PROPOSED IMPROVED TECHNICAL SPECIFICATIONS (ITS) AND BASES

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.5

## Control Rod OPERABILITY Refueling

## MARKUP OF CURRENT TECHNICAL SPECIFICATIONS (CTS)

M1

Insert New Specification 3.9.5

Insert new Specification 3.9.5, "Control Rod OPERABILITY - Refueling," as shown in the James A. FitzPatrick Improved Technical Specifications.

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.5

### Control Rod OPERABILITY Refueling

## DISCUSSION OF CHANGES (DOCs) TO THE CTS

ADMINISTRATIVE CHANGES

None

TECHNICAL CHANGES - MORE RESTRICTIVE

M1 A new Specification concerning Control Rod Operability during refueling, is proposed to be added as ITS 3.9.5. The proposed Specification will require that each withdrawn control rod must be Operable when in MODE 5. The Required Action for not meeting the LCO is to initiate action to fully insert the withdrawn inoperable control rod. The associated Surveillance Requirements are to insert each withdrawn control rod at least one notch every 7 days and verify adequate scram accumulator pressure for each withdrawn control rod every 7 days. This proposed Specification helps ensure control rod scram capability exists and constitutes a more restrictive change.

TECHNICAL CHANGES - LESS RESTRICTIVE (GENERIC)

None

TECHNICAL CHANGES - LESS RESTRICTIVE (SPECIFIC)

None

TECHNICAL CHANGES - RELOCATIONS

None

# JAFNPP

**IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION**

**ITS: 3.9.5**

Control Rod OPERABILITY Refueling

**NO SIGNIFICANT HAZARDS CONSIDERATION (NSHC) FOR LESS RESTRICTIVE CHANGES**

TECHNICAL CHANGES - LESS RESTRICTIVE (SPECIFIC)

There are no plant specific less restrictive changes identified for this Specification.

# JAFNPP

**IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION**

**ITS: 3.9.5**

Control Rod OPERABILITY Refueling

**MARKUP OF NUREG-1433, REVISION 1 SPECIFICATION**

3.9 REFUELING OPERATIONS

3.9.5 Control Rod OPERABILITY—Refueling

[M1] LCO 3.9.5 Each withdrawn control rod shall be OPERABLE.

[M1] APPLICABILITY: MODE 5.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| [M1] A. One or more withdrawn control rods inoperable. | A.1 Initiate action to fully insert inoperable withdrawn control rods. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| [M1] SR 3.9.5.1 | -------------------NOTE------------------- Not required to be performed until 7 days after the control rod is withdrawn. ------------------------------------------- Insert each withdrawn control rod at least one notch. | 7 days |
| [M1] SR 3.9.5.2 | Verify each withdrawn control rod scram accumulator pressure is ≥ [940] psig. | 7 days DB1 |



Typ All pages

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.5

## Control Rod OPERABILITY Refueling

## JUSTIFICATION FOR DIFFERENCES (JFDs) FROM NUREG-1433, REVISION 1

JUSTIFICATION FOR DIFFERENCES FROM NUREG-1433, REVISION 1
ITS: 3.9.5 - CONTROL ROD OPERABILITY - REFUELING

RETENTION OF EXISTING REQUIREMENT (CLB)

None

PLANT-SPECIFIC WORDING PREFERENCE OR MINOR EDITORIAL IMPROVEMENT (PA)

None

PLANT-SPECIFIC DIFFERENCE IN THE DESIGN (DB)

DB1 The brackets have been removed and the proper plant specific value/nomenclature has been provided.

DIFFERENCE BASED ON AN APPROVED TRAVELER (TA)

None

DIFFERENCE BASED ON A SUBMITTED, BUT PENDING TRAVELER (TP)

None

DIFFERENCE FOR ANY REASON OTHER THAN THE ABOVE (X)

None

# JAFNPP

**IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION**

## ITS: 3.9.5

## Control Rod OPERABILITY Refueling

## MARKUP OF NUREG-1433, REVISION 1, BASES

## B 3.9 REFUELING OPERATIONS

## B 3.9.5 Control Rod OPERABILITY—Refueling

**BASES**

**BACKGROUND**

Control rods are components of the Control Rod Drive (CRD) System, the primary reactivity control system for the reactor. In conjunction with the Reactor Protection System, the CRD System provides the means for the reliable control of reactivity changes during refueling operation. In addition, the control rods provide the capability to maintain the reactor subcritical under all conditions and to limit the potential amount and rate of reactivity increase caused by a malfunction in the CRD System.

CLB1

UFSAR, Section 16.6

~~GDC 26 of 10 CFR 50, Appendix A~~, requires that one of the two required independent reactivity control systems be capable of holding the reactor core subcritical under cold conditions (Ref. 1). The CRD System is the system capable of maintaining the reactor subcritical in cold conditions.

PA1

**APPLICABLE SAFETY ANALYSES**

, "Refuel Position One-Rod-Out Interlock"

, "SHUTDOWN MARGIN (SDM)"

"Reactor Protection System (RPS) Instrumentation"

, "Control Rod Block Instrumentation

, "Refueling Equipment Interlocks,"

PA1

PA1

Prevention and mitigation of prompt reactivity excursions during refueling are provided by refueling interlocks (LCO 3.9.1) and LCO 3.9.2), the SDM (LCO 3.1.1), the intermediate range monitor neutron flux scram (LCO 3.3.1.1), and the control rod block instrumentation (LCO 3.3.2.1).

The safety analyses for the control rod withdrawal error during refueling (Ref. 2) and the fuel assembly insertion error (Ref. 3) evaluate the consequences of control rod withdrawal during refueling and also fuel assembly insertion with a control rod withdrawn. A prompt reactivity excursion during refueling could potentially result in fuel failure with subsequent release of radioactive material to the environment. Control rod scram provides protection should a prompt reactivity excursion occur.

Control rod OPERABILITY during refueling satisfies Criterion 3 of ~~the NRC Policy Statement~~.

10 CFR 50.36 (c)(2)(ii)(Ref. 4)

X1

(continued)



Typ All Pages

BASES (continued)

LCO

Each withdrawn control rod must be OPERABLE. The withdrawn control rod is considered OPERABLE if the scram accumulator pressure is ≥ [940] psig and the control rod is capable of being automatically inserted upon receipt of a scram signal. Inserted control rods have already completed their reactivity control function, and therefore are not required to be OPERABLE. DB1

APPLICABILITY

During MODE 5, withdrawn control rods must be OPERABLE to ensure that in a scram the control rods will insert and provide the required negative reactivity to maintain the reactor subcritical.

For MODES 1 and 2, control rod requirements are found in LCO 3.1.2, "Reactivity Anomalies," LCO 3.1.3, "Control Rod OPERABILITY," LCO 3.1.4, "Control Rod Scram Times," and LCO 3.1.5, "Control Rod Scram Accumulators." During MODES 3 and 4, control rods are not able to be withdrawn since the reactor mode switch is in shutdown and a control rod block is applied. This provides adequate requirements for control rod OPERABILITY during these conditions.

ACTIONS

A.1

With one or more withdrawn control rods inoperable, action must be immediately initiated to fully insert the inoperable control rod(s). Inserting the control rod(s) ensures the shutdown and scram capabilities are not adversely affected. Actions must continue until the inoperable control rod(s) is fully inserted.

SURVEILLANCE REQUIREMENTS

SR 3.9.5.1 and SR 3.9.5.2

During MODE 5, the OPERABILITY of control rods is primarily required to ensure a withdrawn control rod will automatically insert if a signal requiring a reactor shutdown occurs. Because no explicit analysis exists for automatic shutdown during refueling, the shutdown function is satisfied if the withdrawn control rod is capable of

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.5.1 and SR 3.9.5.2 (continued)

automatic insertion and the associated CRD scram accumulator pressure is ≥ [940] psig. DB1

The 7 day Frequency takes into consideration equipment reliability, procedural controls over the scram accumulators, and control room alarms and indicating lights that indicate low accumulator charge pressures.

SR 3.9.5.1 is modified by a Note that allows 7 days after withdrawal of the control rod to perform the Surveillance. This acknowledges that the control rod must first be withdrawn before performance of the Surveillance, and therefore avoids potential conflicts with SR 3.0.3 and SR 3.0.4.

CLB1

REFERENCES

1. ~~10 CFR 50, Appendix A, GDC 26~~ UFSAR, Section 16.6
2. UFSAR, Section ~~[15.1.13]~~ 14.5.4.3. DB2
3. UFSAR, Section ~~[15.1.14]~~ 14.5.4.4. DB2
4. 10 CFR 50.36 (c)(2)(ii) X1

PA3

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.5

## Control Rod OPERABILITY Refueling

## JUSTIFICATION FOR DIFFERENCES (JFDs) FROM NUREG-1433, REVISION 1, BASES

JUSTIFICATION FOR DIFFERENCES FROM NUREG-1433, REVISION 1
ITS BASES: 3.9.5 - CONTROL ROD OPERABILITY-REFUELING

RETENTION OF EXISTING REQUIREMENT (CLB)

CLB1 JAFNPP was designed and under construction prior to the promulgation of Appendix A to 10 CFR 50 - General Design Criteria for Nuclear Power Plants. The JAFNPP Construction Permit was issued on May 20, 1970. The proposed General Design Criteria (GDC) were published in the Federal Register on July 11, 1967 (32 FR 10213) and became effective on February 20, 1971 (32 FR 3256). UFSAR, Section 16.6 - Conformance to AEC Design Criteria, describes the JAFNPP current licensing basis with regard to the GDC. ISTS statements concerning the GDC are modified in the ITS to reference UFSAR, Section 16.6.

PLANT-SPECIFIC WORDING PREFERENCE OR MINOR EDITORIAL IMPROVEMENT (PA)

PA1 Editorial change made for enhanced clarity or to be consistent with similar statements in other places in the Bases.

PA2 Not Used.

PA3 Changes have been made to reflect the plant specific nomenclature.

PLANT-SPECIFIC DIFFERENCE IN THE DESIGN (DB)

DB1 The brackets have been removed and the proper plant specific value has been provided.

DB2 The brackets have been removed and the appropriate JAFNPP references provided.

DIFFERENCE BASED ON AN APPROVED TRAVELER (TA)

None

DIFFERENCE BASED ON A SUBMITTED, BUT PENDING TRAVELER (TP)

None

DIFFERENCE FOR ANY REASON OTHER THAN THE ABOVE (X)

X1 NUREG-1433, Revision 1, Bases reference to "the NRC Policy Statement" has been replaced with 10 CFR 50.36(c)(2)(ii), in accordance with 60 FR 36953 effective August 18, 1995.

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.5

## Control Rod OPERABILITY Refueling

## RETYPED PROPOSED IMPROVED TECHNICAL SPECIFICATIONS (ITS) AND BASES

# 3.9 REFUELING OPERATIONS

## 3.9.5 Control Rod OPERABILITY – Refueling

LCO 3.9.5 Each withdrawn control rod shall be OPERABLE.

APPLICABILITY: MODE 5.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more withdrawn control rods inoperable. | A.1 Initiate action to fully insert inoperable withdrawn control rods. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.9.5.1 | -----------------NOTE-------------------<br>Not required to be performed until 7 days after the control rod is withdrawn.<br>----------------------------------------<br>Insert each withdrawn control rod at least one notch. | 7 days |
| SR 3.9.5.2 | Verify each withdrawn control rod scram accumulator pressure is ≥ 940 psig. | 7 days |

## B 3.9 REFUELING OPERATIONS

## B 3.9.5 Control Rod OPERABILITY – Refueling

BASES

**BACKGROUND**

Control rods are components of the Control Rod Drive (CRD) System, the primary reactivity control system for the reactor. In conjunction with the Reactor Protection System, the CRD System provides the means for the reliable control of reactivity changes during refueling operation. In addition, the control rods provide the capability to maintain the reactor subcritical under all conditions and to limit the potential amount and rate of reactivity increase caused by a malfunction in the CRD System.

UFSAR, Section 16.6, requires that one of the two required independent reactivity control systems be capable of holding the reactor core subcritical under cold conditions (Ref. 1). The CRD System is the system capable of maintaining the reactor subcritical in cold conditions.

**APPLICABLE SAFETY ANALYSES**

Prevention and mitigation of prompt reactivity excursions during refueling are provided by refueling interlocks (LCO 3.9.1, "Refueling Equipment Interlocks," and LCO 3.9.2, "Refuel Position One-Rod-Out Interlock"), the SDM (LCO 3.1.1, "SHUTDOWN MARGIN (SDM)"), the intermediate range monitor neutron flux scram (LCO 3.3.1.1, "Reactor Protection System (RPS) Instrumentation"), and the control rod block instrumentation (LCO 3.3.2.1, "Control Rod Block Instrumentation").

The safety analyses for the control rod withdrawal error during refueling (Ref. 2) and the fuel assembly insertion error (Ref. 3) evaluate the consequences of control rod withdrawal during refueling and also fuel assembly insertion with a control rod withdrawn. A prompt reactivity excursion during refueling could potentially result in fuel failure with subsequent release of radioactive material to the environment. Control rod scram provides protection should a prompt reactivity excursion occur.

Control rod OPERABILITY during refueling satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii) (Ref. 3).

(continued)

BASES (continued)

LCO

Each withdrawn control rod must be OPERABLE. The withdrawn control rod is considered OPERABLE if the scram accumulator pressure is ≥ 940 psig and the control rod is capable of being automatically inserted upon receipt of a scram signal. Inserted control rods have already completed their reactivity control function, and therefore are not required to be OPERABLE.

APPLICABILITY

During MODE 5, withdrawn control rods must be OPERABLE to ensure that in a scram the control rods will insert and provide the required negative reactivity to maintain the reactor subcritical.

For MODES 1 and 2, control rod requirements are found in LCO 3.1.2, "Reactivity Anomalies," LCO 3.1.3, "Control Rod OPERABILITY," LCO 3.1.4, "Control Rod Scram Times," and LCO 3.1.5, "Control Rod Scram Accumulators." During MODES 3 and 4, control rods are not able to be withdrawn since the reactor mode switch is in shutdown and a control rod block is applied. This provides adequate requirements for control rod OPERABILITY during these conditions.

ACTIONS

A.1

With one or more withdrawn control rods inoperable, action must be immediately initiated to fully insert the inoperable control rod(s). Inserting the control rod(s) ensures the shutdown and scram capabilities are not adversely affected. Actions must continue until the inoperable control rod(s) is fully inserted.

SURVEILLANCE REQUIREMENTS

SR 3.9.5.1 and SR 3.9.5.2

During MODE 5, the OPERABILITY of control rods is primarily required to ensure a withdrawn control rod will automatically insert if a signal requiring a reactor shutdown occurs. Because no explicit analysis exists for automatic shutdown during refueling, the shutdown function is satisfied if the withdrawn control rod is capable of

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.5.1 and SR 3.9.5.2 (continued)

automatic insertion and the associated CRD scram accumulator pressure is ≥ 940 psig.

The 7 day Frequency takes into consideration equipment reliability, procedural controls over the scram accumulators, and control room alarms and indicating lights that indicate low accumulator charge pressures.

SR 3.9.5.1 is modified by a Note that allows 7 days after withdrawal of the control rod to perform the Surveillance. This acknowledges that the control rod must first be withdrawn before performance of the Surveillance, and therefore avoids potential conflicts with SR 3.0.3 and SR 3.0.4.

REFERENCES

1. UFSAR, Section 16.6.
2. UFSAR, Section 14.5.4.3.
3. UFSAR, Section 14.5.4.4.
4. 10 CFR 50.36(c)(2)(ii).

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.6

## Reactor Pressure Vessel (RPV) Water Level

MARKUP OF CURRENT TECHNICAL SPECIFICATIONS (CTS)

DISCUSSION OF CHANGES (DOCs) TO THE CTS

NO SIGNIFICANT HAZARDS CONSIDERATION (NSHC) FOR LESS RESTRICTIVE CHANGES

MARKUP OF NUREG-1433, REVISION 1, SPECIFICATION

JUSTIFICATION FOR DIFFERENCES (JFDs) FROM NUREG-1433, REVISION 1
MARKUP OF NUREG-1433, REVISION 1, BASES

JUSTIFICATION FOR DIFFERENCES (JFDs) FROM NUREG-1433, REVISION 1, BASES

RETYPED PROPOSED IMPROVED TECHNICAL SPECIFICATIONS (ITS) AND BASES

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.6

Reactor Pressure Vessel (RPV) Water Level

## MARKUP OF CURRENT TECHNICAL SPECIFICATIONS (CTS)

Insert New Specification 3.9.6

Insert new Specification 3.9.6, "RPV Water Level" as shown in the JAFNPP Improved Technical Specifications.

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.6

### Reactor Pressure Vessel (RPV) Water Level

## DISCUSSION OF CHANGES (DOCs) TO THE CTS

## DISCUSSION OF CHANGES
## ITS: 3.9.6 - REACTOR PRESSURE VESSEL (RPV) WATER LEVEL

ADMINISTRATIVE CHANGES

None

TECHNICAL CHANGES - MORE RESTRICTIVE

M1 A new Specification concerning reactor vessel water level is proposed to be added as ITS 3.9.6. This Specification requires that Reactor Pressure Vessel (RPV) water level be ≥ 22 ft 2 inches above the top of the RPV flange during the movement of fuel assemblies and control rods within the RPV flange. RPV water level is an initial condition in the analysis of a refueling accident. The Required Action for not meeting the LCO is to immediately suspend movement of fuel assemblies and control rods within the RPV. The associated Surveillance Requirement is to verify RPV water level is within the limit every 24 hours. This proposed Specification helps ensure that the doses at the site boundary will be within limits and constitutes a more restrictive change.

TECHNICAL CHANGES - LESS RESTRICTIVE (GENERIC)

None

TECHNICAL CHANGES - LESS RESTRICTIVE (SPECIFIC)

None

TECHNICAL CHANGES - RELOCATIONS

None

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.6

### Reactor Pressure Vessel (RPV) Water Level

## NO SIGNIFICANT HAZARDS CONSIDERATION (NSHC) FOR LESS RESTRICTIVE CHANGES

NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS: 3.9.6 - REACTOR PRESSURE VESSEL (RPV) WATER LEVEL

TECHNICAL CHANGES - LESS RESTRICTIVE (SPECIFIC)

There are no plant specific less restrictive changes identified for this Specification.

# JAFNPP

**IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION**

**ITS: 3.9.6**

Reactor Pressure Vessel (RPV) Water Level

**MARKUP OF NUREG-1433, REVISION 1 SPECIFICATION**

## 3.9 REFUELING OPERATIONS

### 3.9.6 [Reactor Pressure Vessel (RPV)] Water Level ~~[—Irradiated Fuel]~~ X1

[M1] LCO 3.9.6 — PA1 [RPV] water level shall be ≥ ~~[23]~~ 2 ft 2 inches above the top of the [RPV flange]. PA1 DB1

[M1] APPLICABILITY: During movement of irradiated fuel assemblies within the [RPV], PA1
~~[During movement of new fuel assemblies or handling of control rods within the [RPV], when irradiated fuel assemblies are seated within the [RPV].]~~ X1

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| [M1] A. PA1 [RPV] water level not within limit. | A.1 Suspend movement of fuel assemblies ~~[and handling of control rods]~~ X1 within the [RPV]. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| [M1] SR 3.9.6.1 | Verify PA1 [RPV] water level is ≥ ~~[23]~~ 2 DB1 ft 2 inches above the top of the [RPV flange]. PA1 | 24 hours |

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.6

## Reactor Pressure Vessel (RPV) Water Level

## JUSTIFICATION FOR DIFFERENCES (JFDs) FROM NUREG-1433, REVISION 1

JUSTIFICATION FOR DIFFERENCES FROM NUREG-1433, REVISION 1
ITS: 3.9.6 - REACTOR PRESSURE VESSEL (RPV) WATER LEVEL

RETENTION OF EXISTING REQUIREMENT (CLB)

None

PLANT-SPECIFIC WORDING PREFERENCE OR MINOR EDITORIAL IMPROVEMENT (PA)

PA1 The brackets have been removed and the information retained.

PLANT-SPECIFIC DIFFERENCE IN THE DESIGN (DB)

DB1 The brackets have been removed and the proper plant specific value has been provided.

DIFFERENCE BASED ON AN APPROVED TRAVELER (TA)

None

DIFFERENCE BASED ON A SUBMITTED, BUT PENDING TRAVELER (TP)

None

DIFFERENCE FOR ANY REASON OTHER THAN THE ABOVE (X)

X1 The brackets have been removed and the associated information deleted or maintained since JAFNPP has elected to not adopt bracketed ISTS 3.9.7, "Reactor Pressure Vessel (RPV) Water Level New Fuel or Control Rods". Therefore during the movement of irradiated fuel assemblies within the Reactor Pressure Vessel (RPV) or during the movement of new fuel assemblies or handling of control rods within the RPV when irradiated fuel assemblies are seated within the RPV, the RPV Water Level will be maintained 22 ft 2 inches above the top of the RPV flange. The allowances in ISTS 3.9.7 are not necessary since JAFNPP outages are planned in such a way that all these operations are performed at a high water level. Although the safety analyses will support the allowances provided in ISTS 3.9.7, this method of operation is conservative.

# JAFNPP

**IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION**

## ITS: 3.9.6

Reactor Pressure Vessel (RPV) Water Level

**MARKUP OF NUREG-1433, REVISION 1, BASES**

## B 3.9 REFUELING OPERATIONS

### B 3.9.6 Reactor Pressure Vessel (RPV) Water Level ~~— Irradiated Fuel~~ X1

BASES

X1 X1

BACKGROUND

2 DB1 2 inches

The movement of ~~irradiated~~ fuel assemblies for handling of control rods within the RPV requires a minimum water level of ~~23~~ 22 ft above the top of the RPV flange. During refueling, this maintains a sufficient water level in the reactor vessel cavity ~~and spent fuel pool~~. Sufficient water is necessary to retain iodine fission product activity in the water in the event of a ~~fuel handling~~ refueling accident (Refs. 1 and 2). Sufficient iodine activity would be retained to limit offsite doses from the accident to ≤ 25% of 10 CFR 100 (Ref 3) limits, as provided by the guidance of Reference ~~3~~ 4.

PA2 PA1 PA3

APPLICABLE SAFETY ANALYSES

PA7 X1

During movement of ~~irradiated~~ fuel assemblies for handling of control rods, the water level in the RPV is an initial condition ~~design parameter~~ in the analysis of a ~~fuel handling~~ refueling accident ~~in containment~~ postulated by ~~Regulatory Guide 1.25 (Ref. 1)~~ Reference 1. A minimum water level of ~~23~~ 22 ft 2 inches above the top of the RPV flange ~~(Regulatory Position C.1.c of Ref. 1)~~ allows a decontamination factor of 100 ~~(Regulatory Position C.1.g of Ref. 1)~~ to be used in the accident analysis for iodine, since more than 23 feet of water is available over the top of the reactor core (Ref. 1). This relates to the assumption that 99% of the total iodine released from the pellet to cladding gap of all ~~the dropped~~ damaged fuel assembly rods is retained by the water. The fuel pellet to cladding gap is assumed to contain 10% of the total fuel rod iodine inventory (Ref. 1).

PA1 DB1 DB2

Analysis of the ~~fuel handling~~ refueling accident inside containment is described in Reference 2. With a minimum water level of ~~23~~ 22 ft 2 inches above the top of the RPV flange and a minimum decay time of 24 hours prior to fuel handling, the analysis and test programs demonstrate that the iodine release due to a postulated ~~fuel handling~~ refueling accident is adequately captured by the water and that offsite doses are maintained within allowable limits (Ref. ~~4~~ 3).

PA1 DB1 DB2 PA3

While the worst case assumptions include the dropping of the irradiated fuel assembly being handled onto the reactor core loaded with irradiated fuel, the possibility exists of the dropped assembly striking the RPV flange and releasing fission products. Therefore, the minimum depth for water coverage to ensure

PA1

(continued)



Typ All Pages

BASES

APPLICABLE SAFETY ANALYSES (continued)

acceptable radiological consequences is specified from the RPV flange. Since the worst case event results in failed fuel assemblies seated in the core, as well as the dropped assembly, dropping an assembly on the RPV flange will result in reduced releases of fission gases. DB1 Based on this judgement, and the physical dimensions which preclude normal operation with water level 23 feet above the flange, a slight reduction in this water level is acceptable (Ref. 4). DB1

10 CFR 50.36(c)(2)(ii) (Ref. 5) X2

RPV water level satisfies Criterion 2 of ~~the NRC Policy Statement~~.

LCO

A minimum water level of [2~~0~~] 2 ft 2 inches DB1 above the top of the RPV flange is required to ensure that the radiological consequences of a postulated ~~fuel handling~~ refueling PA1 accident are within acceptable limits, as provided by the guidance of Reference ~~3~~ 4 PA3.

APPLICABILITY

LCO 3.9.6 X1 is applicable when moving ~~[irradiated]~~ X1 fuel assemblies ~~[or handling control rods (i.e., movement with other than the normal control rod drive)]~~ within the RPV. The LCO minimizes the possibility of a ~~fuel handling~~ refueling PA1 accident ~~in containment~~ PA7 that is beyond the assumptions of the safety analysis. DB1 [If irradiated fuel is not present within the RPV, there can be no significant radioactivity release as a result of a postulated ~~fuel handling~~ refueling accident.] ~~Requirements for handling of new fuel assemblies or control rods (where water depth to the RPV flange is not of concern) are covered by LCO 3.9.7, "RPV Water Level - New Fuel or Control Rods."~~ X1 PA7 Requirements for fuel ~~handling accidents~~ movement in the spent fuel storage pool are covered by LCO 3.7.~~8~~ 7, "Spent Fuel Storage Pool Water Level." PA4

~~Reviewer's Note: LCO 3.9.6 is written to cover new fuel and control rods as well as irradiated fuel. If a plant adopts LCO 3.9.7, however, the second bracketed portion of this Applicability is adopted in lieu of the first bracketed portion, and the LCO name and Required Action A.1 modified appropriately.~~ PA5

(continued)

BASES (continued)

2 inches

ACTIONS

A.1

DB1

If the water level is < [23] ft above the top of the RPV flange, all operations involving movement of ~~[irradiated]~~ X1 fuel assemblies [and handling of control rods] within the RPV shall be suspended immediately to ensure that a fuel handling accident cannot occur. The suspension of ~~[irradiated]~~ fuel movement [and control rod handling] shall not preclude completion of movement of a component to a safe position.

PA1

SURVEILLANCE REQUIREMENTS

SR 3.9.6.1

refueling DB1 2 inches

Verification of a minimum water level of [23] ft above the top of the RPV flange ensures that the design basis for the postulated ~~fuel handling~~ accident analysis during refueling operations is met. Water at the required level limits the consequences of damaged fuel rods, which are postulated to result from a ~~fuel handling~~ refueling PA1 accident in containment (Ref. 2).

The Frequency of 24 hours is based on engineering judgment and is considered adequate in view of the large volume of water and the normal procedural controls on valve positions, which make significant unplanned level changes unlikely.

REFERENCES

1. Regulatory Guide 1.25, March 23, 1972.
2. PA6 [U]FSAR, Section ~~[15.1.4]~~ 14.6.1.4. DB1
3. 4 Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants, NUREG-0800, Section 15.7.4, Revision 1, Radiological Consequences of Fuel Handling Accident, July 1981 PA7 PA3
4. 3 10 CFR 100.11.

5. 10 CFR 50.36 (c) (2) (ii) X2

Assumptions Used for Evaluating the Potential Radiological Consequences of A Fuel Handling Accident In the Fuel Handling And Storage Facility For Boiling And Pressurized Water Reactors, PA7

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.6

## Reactor Pressure Vessel (RPV) Water Level

## JUSTIFICATION FOR DIFFERENCES (JFDs) FROM NUREG-1433, REVISION 1, BASES

## JUSTIFICATION FOR DIFFERENCES FROM NUREG-1433, REVISION 1
## ITS BASES: 3.9.6 - REACTOR PRESSURE VESSEL (RPV) WATER LEVEL

RETENTION OF EXISTING REQUIREMENT (CLB)

None

PLANT-SPECIFIC WORDING PREFERENCE OR MINOR EDITORIAL IMPROVEMENT (PA)

PA1 Changes have been made (additions, deletions, and/or changes to the NUREG) to reflect the plant specific analysis description.

PA2 This Specification is not applicable to the spent fuel storage pool. Therefore, this statement has been deleted.

PA3 The proper Reference number has been identified, and subsequent references have been renumbered.

PA4 The proper LCO number has been included.

PA5 The "Reviewer's Note" has been deleted since there was no intent to maintain the Note in the plant specific ITS.

PA6 Changes have been made to reflect the plant specific nomenclature.

PA7 Changes have been made for clarity with no change in intent.

PLANT-SPECIFIC DIFFERENCE IN THE DESIGN (DB)

DB1 The brackets have been removed and the proper plant specific value/information provided. A value of 22 ft 2 inches has been included throughout the Bases. The Bases has been modified to reflect the plant specific analyses.

DB2 Changes have been made to reflect the plant specific analysis.

DIFFERENCE BASED ON AN APPROVED TRAVELER (TA)

None

DIFFERENCE BASED ON A SUBMITTED, BUT PENDING TRAVELER (TP)

None

DIFFERENCE FOR ANY REASON OTHER THAN THE ABOVE (X)

X1 The brackets have been removed and the associated information deleted or maintained since JAFNPP has elected to not adopt bracketed ISTS 3.9.7, "Reactor Pressure Vessel (RPV) Water Level New Fuel or Control Rods". Therefore during the movement of irradiated fuel assemblies within the Reactor Pressure Vessel (RPV) or during the movement of new fuel assemblies or handling of control rods within the RPV when irradiated fuel assemblies are seated within the RPV, the RPV Water Level will be maintained 22 ft 2 inches above the top of the RPV flange. The allowances in ISTS 3.9.7 are not necessary since JAFNPP outages are planned in such a way that all these operations are performed at a high water level. Although the safety analyses will support the allowances provided in ISTS 3.9.7, this method of operation is conservative.

X2 NUREG-1433, Revision 1, Bases reference to "the NRC Policy Statement" has been replaced with 10 CFR 50.36(c)(2)(ii), in accordance with 60 FR 36953 effective August 18, 1995.

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.6

Reactor Pressure Vessel (RPV) Water Level

## RETYPED PROPOSED IMPROVED TECHNICAL SPECIFICATIONS (ITS) AND BASES

# 3.9 REFUELING OPERATIONS

## 3.9.6 Reactor Pressure Vessel (RPV) Water Level

LCO 3.9.6 RPV water level shall be ≥ 22 ft 2 inches above the top of the RPV flange.

APPLICABILITY: During movement of irradiated fuel assemblies within the RPV,
During movement of new fuel assemblies or handling of control rods within the RPV, when irradiated fuel assemblies are seated within the RPV.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. RPV water level not within limit. | A.1 Suspend movement of fuel assemblies and handling of control rods within the RPV. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.9.6.1 | Verify RPV water level is ≥ 22 ft 2 inches above the top of the RPV flange. | 24 hours |

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.7

## Residual Heat Removal (RHR) High Water Level

MARKUP OF CURRENT TECHNICAL SPECIFICATIONS (CTS)

DISCUSSION OF CHANGES (DOCs) TO THE CTS

NO SIGNIFICANT HAZARDS CONSIDERATION (NSHC) FOR LESS RESTRICTIVE CHANGES

MARKUP OF NUREG-1433, REVISION 1, SPECIFICATION

JUSTIFICATION FOR DIFFERENCES (JFDs) FROM NUREG-1433, REVISION 1
MARKUP OF NUREG-1433, REVISION 1, BASES

JUSTIFICATION FOR DIFFERENCES (JFDs) FROM NUREG-1433, REVISION 1, BASES

RETYPED PROPOSED IMPROVED TECHNICAL SPECIFICATIONS (ITS) AND BASES

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.7

## Residual Heat Removal (RHR) High Water Level

## MARKUP OF CURRENT TECHNICAL SPECIFICATIONS (CTS)

Insert New Specification 3.9.7

Insert new Specification 3.9.7, "Residual Heat Removal (RHR) - High Water Level," as shown in the JAFNPP Improved Technical Specifications.

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.7

## Residual Heat Removal (RHR) High Water Level

## DISCUSSION OF CHANGES (DOCs) TO THE CTS

# DISCUSSION OF CHANGES
## ITS: 3.9.7 - RESIDUAL HEAT REMOVAL (RHR) – HIGH WATER LEVEL

ADMINISTRATIVE CHANGES

None

TECHNICAL CHANGES - MORE RESTRICTIVE

M1 A new Specification for the RHR shutdown cooling (SDC) subsystem in MODE 5 is proposed to be added as ITS 3.9.7. This Specification requires that one RHR SDC subsystem be Operable in MODE 5 with water level ≥ 22 ft 2 inches above the top of the RPV flange. The Required Actions for an inoperable RHR SDC subsystem are to verify an alternate method of decay heat removal within 1 hour and every 24 hours thereafter, or to immediately suspend loading irradiated fuel assemblies into the reactor pressure vessel (RPV) and to initiate action to restore secondary containment, one Standby Gas Treatment (SGT) subsystem, and isolation capability in each required secondary containment flow path not isolated. The associated Surveillance Requirement is to verify the required RHR SDC subsystem valve lineup every 31 days. This proposed Specification satisfies Criterion 4 of 10 CFR 50.36(c)(2)(ii) and constitutes a more restrictive change.

TECHNICAL CHANGES - LESS RESTRICTIVE (GENERIC)

None

TECHNICAL CHANGES - LESS RESTRICTIVE (SPECIFIC)

None

TECHNICAL CHANGES - RELOCATIONS

None

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.7

## Residual Heat Removal (RHR) High Water Level

## NO SIGNIFICANT HAZARDS CONSIDERATION (NSHC) FOR LESS RESTRICTIVE CHANGES

## NO SIGNIFICANT HAZARDS CONSIDERATIONS
## ITS: 3.9.7 - RESIDUAL HEAT REMOVAL (RHR) – HIGH WATER LEVEL

TECHNICAL CHANGE - LESS RESTRICTIVE (SPECIFIC)

There are no plant specific less restrictive changes identified for this Specification.

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.7

### Residual Heat Removal (RHR) High Water Level

## MARKUP OF NUREG-1433, REVISION 1 SPECIFICATION

## 3.9 REFUELING OPERATIONS

### 3.9.~~8~~ 7 Residual Heat Removal (RHR)—High Water Level

PA1

LCO 3.9.~~8~~ 7 — One RHR shutdown cooling subsystem shall be OPERABLE ~~and in operation~~. CLB1

M1

~~-----NOTE-----~~
~~The required RHR shutdown cooling subsystem may be removed from operation for up to 2 hours per 8 hour period.~~

APPLICABILITY: MODE 5 with irradiated fuel in the reactor pressure vessel (~~RPV~~) RPV and the water level ≥ ~~[23]~~ 2 ft 2 inches above the top of the ~~[~~RPV flange~~]~~.

PA2 DB1

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Required RHR shutdown cooling subsystem inoperable. | A.1 Verify an alternate method of decay heat removal is available. | 1 hour<br>AND<br>Once per 24 hours thereafter |
| B. Required Action and associated Completion Time of Condition A not met. | B.1 Suspend loading irradiated fuel assemblies into the RPV.<br>AND | Immediately |

M1

M1

(continued)

PA1

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| B. (continued) | B.2 Initiate action to restore [secondary] containment to OPERABLE status. | Immediately |
| | AND | |
| | B.3 Initiate action to restore one standby gas treatment subsystem to OPERABLE status. | Immediately |
| | AND | |
| | B.4 Initiate action to restore isolation capability in each required [secondary] containment penetration flow path not isolated. | Immediately |
| C. No RHR shutdown cooling subsystem in operation. | C.1 Verify reactor coolant circulation by an alternate method. | 1 hour from discovery of no reactor coolant circulation<br>AND<br>Once per 12 hours thereafter |
| | AND | |
| | C.2 Monitor reactor coolant temperature. | Once per hour |

DB1

DB1

CLB1

SURVEILLANCE REQUIREMENTS PA2

SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | | FREQUENCY |
|---|---|---|---|
| M1 | SR 3.9.~~8~~.1 (7) PA1 | Verify ~~one~~ each required CLB1 RHR shutdown cooling subsystem ~~is operating~~ manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, is aligned or can be aligned to its correct position. CLB1 | ~~12 hours~~ 31 days CLB1 |

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.7

## Residual Heat Removal (RHR) High Water Level

## JUSTIFICATION FOR DIFFERENCES (JFDs) FROM NUREG-1433, REVISION 1

JUSTIFICATION FOR DIFFERENCES FROM NUREG-1433, REVISION 1
ITS: 3.9.7 - RESIDUAL HEAT REMOVAL (RHR) – HIGH WATER LEVEL

RETENTION OF EXISTING REQUIREMENT (CLB)

CLB1 ISTS 3.9.8 (ITS 3.9.7) requirements associated with an RHR shutdown cooling subsystem being in operation have been deleted. The requirement that one RHR shutdown cooling subsystem is Operable is considered acceptable. Requirements for RHR shutdown cooling subsystem operations are adequately controlled by JAFNPP plant operating procedures. The LCO, Actions and Surveillance have been revised to reflect this change. This change is necessary since at times the RHR shutdown cooling subsystem is not required to be in operation to maintain plant operations within the allowable regions of the Reactor Coolant System (RCS) pressure and temperature (P/T) Limits curves of ITS LCO 3.4.9, "RCS Pressure and Temperature (P/T) Limits" (e.g. during extended outages) or to maintain a comfortable environment for refueling activities. The fuel will remain adequately cooled with 22 ft 2 inches of water above the RPV flange.

PLANT-SPECIFIC WORDING PREFERENCE OR MINOR EDITORIAL IMPROVEMENT (PA)

PA1 ISTS 3.9.8 has been renumbered as ITS 3.9.7 to reflect deletion of a previous Specification. The surveillances have been renumbered, where applicable to reflect this change.

PA2 Typographical error corrected.

PLANT-SPECIFIC DIFFERENCE IN THE DESIGN (DB)

DB1 The brackets have been removed and the proper plant specific value/nomenclature has been provided.

DIFFERENCE BASED ON AN APPROVED TRAVELER (TA)

None

DIFFERENCE BASED ON A SUBMITTED, BUT PENDING TRAVELER (TP)

None

DIFFERENCE FOR ANY REASON OTHER THAN THE ABOVE (X)

None

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.7

### Residual Heat Removal (RHR) High Water Level

## MARKUP OF NUREG-1433, REVISION 1, BASES

# B 3.9 REFUELING OPERATIONS

## B 3.9.8 Residual Heat Removal (RHR)—High Water Level 7 PA1

Either PA2

BASES

**BACKGROUND** CLB1 the JAFNPP UFSAR (Ref. 1)

The purpose of the RHR System in MODE 5 is to remove decay heat and sensible heat from the reactor coolant, as required by GDC 34. Each of the two shutdown cooling loops of the RHR System can provide the required decay heat removal. Each loop consists of two motor driven pumps, a heat exchanger, and associated piping and valves. Both loops have a common suction from the same recirculation loop. Each pump discharges the reactor coolant, after it has been cooled by circulation through the respective heat exchangers, to the reactor via the associated recirculation loop ~~or to the reactor via the low pressure coolant injection path~~. The RHR heat exchangers transfer heat to the RHR Service Water System. The RHR shutdown cooling mode is manually controlled. DB1

shutdown cooling mode of the RHR system PA3

In addition to the RHR subsystems, the volume of water above the reactor pressure vessel (RPV) flange provides a heat sink for decay heat removal.

PA3 plant shutdown cooling mode of the

**APPLICABLE SAFETY ANALYSES** X1 10 CFR 50.36(c)(2)(ii) (Ref. 2)

With the unit in MODE 5, the RHR System is not required to mitigate any events or accidents evaluated in the safety analyses. The RHR System is required for removing decay heat to maintain the temperature of the reactor coolant. satisfies X1

~~Although the~~ RHR System ~~does not meet a specific~~ criterion 4 ~~of the NRC Policy Statement, it was identified in the NRC Policy Statement as an important contributor to risk reduction. Therefore, the RHR System is retained as a Specification.~~

CLB2 2 inches PA3 top of the

**LCO**

Only one RHR shutdown cooling subsystem is required to be OPERABLE ~~and in operation~~ in MODE 5 with irradiated fuel in the RPV and the water level ≥ ~~23~~ ft above the RPV flange. Only one subsystem is required because the volume of water above the RPV flange provides backup decay heat removal capability. 2 DB2

(continued)

PA1

BASES

an RHR service water pump capable of providing cooling to the heat exchangers

X2

LCO (continued)

An OPERABLE RHR shutdown cooling subsystem consists of an RHR pump, a heat exchanger, valves, piping, instruments, and controls to ensure an OPERABLE flow path. In MODE 5, the RHR cross tie valve ~~is~~ s are not required to be closed; thus, the valve may be opened to allow pumps in one loop to discharge through the opposite ~~loop's heat exchanger~~ recirculation loop to make a complete subsystem.

DB3

DB3

Additionally, each RHR shutdown cooling subsystem is considered OPERABLE if it can be manually aligned (~~remote or local~~ from the control room or locally) in the shutdown cooling mode for removal of decay heat. Operation (either continuous or intermittent) of one subsystem can maintain and reduce the reactor coolant temperature as required. ~~However, to ensure adequate core flow to allow for accurate average reactor coolant temperature monitoring, nearly continuous operation is required. A Note is provided to allow a 2 hour exception to shut down the operating subsystem every 8 hours.~~

PA2

CLB2

APPLICABILITY

One RHR shutdown cooling subsystem must be OPERABLE ~~and in operation~~ in MODE 5, with irradiated fuel in the reactor pressure vessel and with the water level ≥ [2~~3~~] feet 2 inches above the top of the RPV flange, to provide decay heat removal. RHR shutdown cooling sub System requirements in other MODES are covered by LCOs in Section 3.4, Reactor Coolant System (RCS)~~; Section 3.5, Emergency Core Cooling Systems (ECCS) and Reactor Core Isolation Cooling (RCIC) System; and Section 3.6, Containment Systems~~. RHR Shutdown Cooling System sub requirements in MODE 5 with irradiated fuel in the reactor pressure vessel and with the water level < [2~~3~~] ft 2 inches above the top of the RPV flange are given in LCO 3.9.~~8~~ 8, "Residual Heat Removal (RHR) — Low Water Level".

② ② CLB2 DB2 PA3 PA4 DB2 PA3 PA3 PA3

PA1

ACTIONS

A.1

With no RHR shutdown cooling subsystem OPERABLE, an alternate method of decay heat removal must be established within 1 hour. In this condition, the volume of water above the top of the RPV flange provides adequate capability to remove decay heat from the reactor core. However, the overall reliability is reduced because loss of water level could

PA3

(continued)

BASES

ACTIONS

A.1 (continued)

result in reduced decay heat removal capability. The 1 hour Completion Time is based on decay heat removal function and the probability of a loss of the available decay heat removal capabilities. Furthermore, verification of the functional availability of these alternate method(s) must be reconfirmed every 24 hours thereafter. This will ensure continued heat removal capability. FA5

PA3 The required cooling capacity of the alternate method should be ensured by verifying (by calculation or demonstration) its capability to maintain or reduce temperature.

Decay heat removal by ambient losses can be considered as, or contributing to, the alternate method capability.

Alternate decay heat removal methods are available to the operators for review and preplanning in the unit's plant Operating Procedures. PA2 For example, this may include the use of the Spent Fuel Pool Cooling system and the DB4 Reactor Water Cleanup System, operating with the regenerative heat exchanger bypassed. Insert A.1 The method used to remove the decay heat should be the most prudent choice based on unit plant conditions. PA2 or in combination with the Control Rod Drive System or Condensate System DB4

B.1, B.2, B.3, and B.4

If no RHR shutdown cooling subsystem is OPERABLE and an alternate method of decay heat removal is not available in accordance with Required Action A.1, actions shall be taken immediately to suspend operations involving an increase in reactor decay heat load by suspending loading of irradiated fuel assemblies into the RPV.

Additional actions are required to minimize any potential fission product release to the environment. This includes ensuring secondary containment is OPERABLE; one standby gas treatment subsystem is OPERABLE; and secondary containment ~~isolation capability (i.e., one secondary containment isolation valve and~~ associated instrumentation are OPERABLE or ~~other~~ acceptable administrative controls ~~to~~ assure ~~isolation capability)~~ in each associated penetration flowpath ~~not isolated that is assumed to be isolated to mitigate radioactive releases~~ is available PA3 Insert B.1, B.2, B.3. ~~This may be performed as an~~ administrative check, by examining logs or other information to determine whether the components are out of service for maintenance or other reasons. It is not necessary to perform the Surveillances needed to demonstrate the OPERABILITY of the components. If, however, any required component is inoperable, then it must be restored to OPERABLE status. In this case, a surveillance may need to

(continued)

DB4

INSERT A.1

In addition, the Alternate Decay Heat Removal System can also be used as a method.

PA3

INSERT B.1, B.2 and B.3

. These administrative controls consist of stationing an operator, who is in continuous communication with the control room, at the controls of the isolation device. In this way, the penetration can be rapidly isolated when a need for secondary containment is indicated

## BASES

**ACTIONS**

B.1, B.2, B.3, and B.4 (continued)

be performed to restore the component to OPERABLE status. Actions must continue until all required components are OPERABLE.

CLB2

~~C.1 and C.2~~

~~If no RHR Shutdown Cooling System is in operation, an alternate method of coolant circulation is required to be established within 1 hour. The Completion Time is modified such that the 1 hour is applicable separately for each occurrence involving a loss of coolant circulation.~~

~~During the period when the reactor coolant is being circulated by an alternate method (other than by the required RHR Shutdown Cooling System), the reactor coolant temperature must be periodically monitored to ensure proper functioning of the alternate method. The once per hour Completion Time is deemed appropriate.~~

**SURVEILLANCE REQUIREMENTS**

SR 3.9.~~8~~ 7.1 PA1

CLB2

Insert SR 3.9.7.1

~~This Surveillance demonstrates that the RHR subsystem is in operation and circulating reactor coolant.~~

~~The required flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability. The Frequency of 12 hours is sufficient in view of other visual and audible indications available to the operator for monitoring the RHR subsystem in the control room.~~

**REFERENCES**

~~None.~~

1. UFSAR Section 16.6 CLB1

2. 10 CFR 50.36 (c)(2)(ii) X1

CLB2

## INSERT SR 3.9.7.1

Verifying the correct alignment for manual, power operated, and automatic valves in the RHR shutdown cooling flow path provides assurance that the proper flow paths will exist for RHR operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these were verified to be in the correct position prior to locking, sealing, or securing. A valve that can be manually (from the control room or locally) aligned is allowed to be in a non-RHR shutdown cooling position provided the valve can be repositioned. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

The 31 day Frequency of this SR was derived from the Inservice Testing Program requirements for performing valve testing at least once every 92 days. The Frequency of 31 days is further justified because the valves are operated under procedural control. This Frequency has been shown to be acceptable through operating experience.

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.7

## Residual Heat Removal (RHR) High Water Level

## JUSTIFICATION FOR DIFFERENCES (JFDs) FROM NUREG-1433, REVISION 1, BASES

RETENTION OF EXISTING REQUIREMENT (CLB)

CLB1 JAFNPP was designed and under construction prior to the promulgation of Appendix A to 10 CFR 50 - General Design Criteria for Nuclear Power Plants. The JAFNPP Construction Permit was issued on May 20, 1970. The proposed General Design Criteria (GDC) were published in the Federal Register on July 11, 1967 (32 FR 10213) and became effective on February 20, 1971 (32 FR 3256). UFSAR, Section 16.6 - Conformance to AEC Design Criteria, describes the JAFNPP current licensing basis with regard to the GDC. ISTS statements concerning the GDC are modified in the ITS to reference UFSAR, Section 16.6.

CLB2 ISTS 3.9.8 (ITS 3.9.7) requirements associated with an RHR shutdown cooling subsystem being in operation have been deleted. The requirement that one RHR shutdown cooling subsystem is Operable is considered acceptable. Requirements for RHR shutdown cooling subsystem operations are adequately controlled by JAFNPP plant operating procedures. The LCO, Actions and Surveillance have been revised to reflect this change. This change is necessary since at times the RHR shutdown cooling subsystem is not required to be in operation to maintain plant operations within the allowable regions of the Reactor Coolant System (RCS) pressure and temperature (P/T) Limits curves of ITS LCO 3.4.9, "RCS Pressure and Temperature (P/T) Limits" (e.g. during extended outages) or to maintain a comfortable environment for refueling activities. The Bases has been changed to reflect this modification to the Specification.

PLANT-SPECIFIC WORDING PREFERENCE OR MINOR EDITORIAL IMPROVEMENT (PA)

PA1 ISTS 3.9.8 has been renumbered as ITS 3.9.7 to reflect deletion of a previous Specification. The surveillances have been renumbered, where applicable to reflect this change.

PA2 Editorial change made with no change in intent.

PA3 Editorial change made for enhanced clarity or to be consistent with similar statements in other places in the Bases.

PA4 RHR shutdown cooling subsystem requirements, which are what this Specification governs, are not covered in other MODES in Sections 3.5 or 3.6. Therefore, this statement has been deleted.

PA5 Typographical/grammatical error corrected.

PLANT-SPECIFIC DIFFERENCE IN THE DESIGN (DB)

DB1 The specific RHR shutdown cooling mode discharge pathway has been included.

DB2 The brackets are removed and the proper plant specific values/nomenclature have been provided.

DB3 The RHR pumps in one loop at JAFNPP cannot discharge to the other loops heat exchanger. In addition, the cross-tie includes two cross tie valves. The correct description is included.

DB4 Specific JAFNPP alternate methods have been included to enhance the Bases.

DIFFERENCE BASED ON AN APPROVED TRAVELER (TA)

None

DIFFERENCE BASED ON A SUBMITTED, BUT PENDING TRAVELER (TP)

None

DIFFERENCE FOR ANY REASON OTHER THAN THE ABOVE (X)

X1 NUREG-1433, Revision 1, Bases reference to "the NRC Policy Statement" has been replaced with 10 CFR 50.36(c)(2)(ii), in accordance with 60 FR 36953 effective August 18, 1995.

X2 RHR service water requirements have been included in the Bases of ITS 3.9.7. This information defines the minimum requirements for OPERABILITY of the RHR heat exchanger in this plant operating MODE. This ensures that the Operability of the RHR subsystem is clearly defined.

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.7

### Residual Heat Removal (RHR) High Water Level

## RETYPED PROPOSED IMPROVED TECHNICAL SPECIFICATIONS (ITS) AND BASES

## B 3.9 REFUELING OPERATIONS

## B 3.9.6 Reactor Pressure Vessel (RPV) Water Level

BASES

**BACKGROUND**

The movement of fuel assemblies or handling of control rods within the RPV requires a minimum water level of 22 ft 2 inches above the top of the RPV flange. During refueling, this maintains a sufficient water level in the reactor vessel cavity. Sufficient water is necessary to retain iodine fission product activity in the water in the event of a refueling accident (Refs. 1 and 2). Sufficient iodine activity would be retained to limit offsite doses from the accident to ≤ 25% of 10 CFR 100 (Ref. 3) limits, as provided by the guidance of Reference 4.

**APPLICABLE SAFETY ANALYSES**

During movement of fuel assemblies or handling of control rods, the water level in the RPV is an initial condition in the analysis of a refueling accident postulated by Reference 1. A minimum water level of 22 ft 2 inches above the top of the RPV flange allows a decontamination factor of 100 to be used in the accident analysis for iodine since more than 23 feet of water is available over the top of the reactor core (Ref. 1). This relates to the assumption that 99% of the total iodine released from the pellet to cladding gap of all damaged fuel assembly rods is retained by the water. The fuel pellet to cladding gap is assumed to contain 10% of the total fuel rod iodine inventory (Ref. 1).

Analysis of the refueling accident inside containment is described in Reference 2. With a minimum water level of 22 ft 2 inches above the top of the RPV flange and a minimum decay time of 24 hours prior to fuel handling, the analysis and test programs demonstrate that the iodine release due to a postulated refueling accident is adequately captured by the water and that offsite doses are maintained within allowable limits (Ref. 3). While the worst case assumptions include the dropping of the irradiated fuel assembly being handled onto the reactor core loaded with irradiated fuel, the possibility exists of the dropped assembly striking the RPV flange and releasing fission products. Therefore, the minimum depth for water coverage to ensure acceptable radiological consequences is specified from the RPV flange.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

Since the worst case event results in failed fuel assemblies seated in the core, as well as the dropped assembly, dropping an assembly on the RPV flange will result in reduced releases of fission gases. Based on this judgement, and the physical dimensions which preclude normal operation with water level 23 feet above the flange, a slight reduction in this water level is acceptable.

RPV water level satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii) (Ref. 5).

LCO

A minimum water level of 22 ft 2 inches above the top of the RPV flange is required to ensure that the radiological consequences of a postulated refueling accident are within acceptable limits, as provided by the guidance of Reference 4.

APPLICABILITY

LCO 3.9.6 is applicable when moving fuel assemblies or handling control rods (i.e., movement with other than the normal control rod drive) within the RPV. The LCO minimizes the possibility of a refueling accident that is beyond the assumptions of the safety analysis. If irradiated fuel is not present within the RPV, there can be no significant radioactivity release as a result of a postulated refueling accident. Requirements for fuel movement in the spent fuel storage pool are covered by LCO 3.7.7, "Spent Fuel Storage Pool Water Level."

ACTIONS

A.1

If the water level is < 22 ft 2 inches above the top of the RPV flange, all operations involving movement of fuel assemblies and handling of control rods within the RPV shall be suspended immediately to ensure that a fuel handling accident cannot occur. The suspension of fuel movement and control rod handling shall not preclude completion of movement of a component to a safe position.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.9.6.1

Verification of a minimum water level of 22 ft 2 inches above the top of the RPV flange ensures that the design basis for the postulated refueling accident analysis during refueling operations is met. Water at the required level limits the consequences of damaged fuel rods, which are postulated to result from a refueling accident in containment (Ref. 2).

The Frequency of 24 hours is based on engineering judgment and is considered adequate in view of the large volume of water and the normal procedural controls on valve positions, which make significant unplanned level changes unlikely.

REFERENCES

1. Regulatory Guide 1.25, Assumptions Used for Evaluating The Potential Radiological Consequences Of A Fuel Handling Accident In The Fuel Handling And Storage Facility For Boiling And Pressurized Water Reactors, March 23, 1972.
2. UFSAR, Section 14.6.1.4.
3. 10 CFR 100.11.
4. NUREG-0800, Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants, Section 15.7.4, Revision 1, Radiological Consequences of Fuel Handling Accident, July 1981.
5. 10 CFR 50.36(c)(2)(ii).

# 3.9 REFUELING OPERATIONS

## 3.9.7 Residual Heat Removal (RHR) – High Water Level

LCO 3.9.7 One RHR shutdown cooling subsystem shall be OPERABLE.

APPLICABILITY: MODE 5 with irradiated fuel in the reactor pressure vessel (RPV) and the water level ≥ 22 ft 2 inches above the top of the RPV flange.

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. Required RHR shutdown cooling subsystem inoperable. | A.1 | Verify an alternate method of decay heat removal is available. | 1 hour<br><br>AND<br><br>Once per 24 hours thereafter |
| B. Required Action and associated Completion Time of Condition A not met. | B.1 | Suspend loading irradiated fuel assemblies into the RPV. | Immediately |
| | AND | | |
| | B.2 | Initiate action to restore secondary containment to OPERABLE status. | Immediately |
| | AND | | |
| | | | (continued) |

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| B. (continued) | B.3 | Initiate action to restore one standby gas treatment subsystem to OPERABLE status. | Immediately |
| | AND | | |
| | B.4 | Initiate action to restore isolation capability in each required secondary containment penetration flow path not isolated. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.9.7.1 | Verify each required RHR shutdown cooling subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, is aligned or can be aligned to its correct position. | 31 days |

## B 3.9 REFUELING OPERATIONS

## B 3.9.7 Residual Heat Removal (RHR) – High Water Level

BASES

| | |
|---|---|
| BACKGROUND | The purpose of the RHR System in MODE 5 is to remove decay heat and sensible heat from the reactor coolant, as required by the JAFNPP UFSAR (Ref. 1). Either of the two shutdown cooling loops of the RHR System can provide the required decay heat removal. Each loop consists of two motor driven pumps, a heat exchanger, and associated piping and valves. Both loops have a common suction from the same recirculation loop. Each pump discharges the reactor coolant, after it has been cooled by circulation through the respective heat exchangers, to the reactor via the associated recirculation loop. The RHR heat exchangers transfer heat to the RHR Service Water System. The RHR shutdown cooling mode is manually controlled.<br><br>In addition to the RHR shutdown cooling mode of the RHR System, the volume of water above the reactor pressure vessel (RPV) flange provides a heat sink for decay heat removal. |
| APPLICABLE SAFETY ANALYSES | With the plant in MODE 5, the RHR shutdown cooling mode of the RHR System is not required to mitigate any events or accidents evaluated in the safety analyses. The RHR shutdown cooling mode of the RHR System is required for removing decay heat to maintain the temperature of the reactor coolant.<br><br>The RHR shutdown cooling mode of the RHR System satisfies Criterion 4 of 10 CFR 50.36(c)(2)(ii) (Ref. 2). |
| LCO | Only one RHR shutdown cooling subsystem is required to be OPERABLE in MODE 5 with irradiated fuel in the RPV and the water level ≥ 22 ft 2 inches above the top of the RPV flange. Only one subsystem is required because the volume of water above the RPV flange provides backup decay heat removal capability. |

(continued)

BASES

LCO (continued)

An OPERABLE RHR shutdown cooling subsystem consists of an RHR pump, a heat exchanger, an RHR Service Water pump capable of providing cooling to the heat exchanger, valves, piping, instruments, and controls to ensure an OPERABLE flow path. In MODE 5, the RHR cross tie valves are not required to be closed; thus, the valve may be opened to allow pumps in one loop to discharge through the opposite recirculation loop to make a complete subsystem.

Additionally, each RHR shutdown cooling subsystem is considered OPERABLE if it can be manually aligned (from the control room or locally) in the shutdown cooling mode for removal of decay heat. Operation (either continuous or intermittent) of one subsystem can maintain and reduce the reactor coolant temperature as required.

APPLICABILITY

One RHR shutdown cooling subsystem must be OPERABLE in MODE 5, with irradiated fuel in the reactor pressure vessel and with the water level ≥ 22 ft 2 inches above the top of the RPV flange, to provide decay heat removal. RHR shutdown cooling subsystem requirements in other MODES are covered by LCOs in Section 3.4, Reactor Coolant System (RCS). RHR shutdown cooling subsystem requirements in MODE 5 with irradiated fuel in the reactor pressure vessel and with the water level < 22 ft 2 inches above the top of the RPV flange are given in LCO 3.9.8, "Residual Heat Removal (RHR) – Low Water Level".

ACTIONS

A.1

With no RHR shutdown cooling subsystem OPERABLE, an alternate method of decay heat removal must be established within 1 hour. In this condition, the volume of water above the top of the RPV flange provides adequate capability to remove decay heat from the reactor core. However, the overall reliability is reduced because loss of water level could result in reduced decay heat removal capability. The 1 hour Completion Time is based on decay heat removal function and the probability of a loss of the available decay heat removal capabilities. Furthermore, verification of the functional availability of the alternate method must be reconfirmed every 24 hours thereafter. This will ensure

(continued)

BASES

ACTIONS

A.1 (continued)

continued heat removal capability.

Alternate decay heat removal methods are available to the operators for review and preplanning in the plant Operating Procedures. The required cooling capacity of the alternate method should be ensured by verifying (by calculation or demonstration) its capability to maintain or reduce temperature. For example, this may include the use of the Spent Fuel Pool Cooling System and the Reactor Water Cleanup System, operating with the regenerative heat exchanger bypassed or in combination with the Control Rod Drive System or Condensate System. In addition, the Alternate Decay Heat Removal System can also be used as a method. The method used to remove the decay heat should be the most prudent choice based on plant conditions. Decay heat removal by ambient losses can be considered as, or contributing to, the alternate method capability.

B.1, B.2, B.3, and B.4

If no RHR shutdown cooling subsystem is OPERABLE and an alternate method of decay heat removal is not available in accordance with Required Action A.1, actions shall be taken immediately to suspend operations involving an increase in reactor decay heat load by suspending loading of irradiated fuel assemblies into the RPV.

Additional actions are required to minimize any potential fission product release to the environment. This includes ensuring secondary containment is OPERABLE; one standby gas treatment subsystem is OPERABLE; and secondary containment isolation capability is available in each associated penetration flowpath not isolated that is assumed to be isolated to mitigate radioactive releases (i.e., one secondary containment isolation valve and associated instrumentation are OPERABLE or acceptable administrative controls assure isolation capability. These administrative controls consist of stationing an operator, who is in continuous communication with the control room, at the controls of the isolation device. In this way, the penetration can be rapidly isolated when a need for secondary containment is indicated). This may be performed as an administrative check, by examining logs or other

(continued)

BASES

ACTIONS

B.1, B.2, B.3, and B.4 (continued)

information to determine whether the components are out of service for maintenance or other reasons. It is not necessary to perform the Surveillances needed to demonstrate the OPERABILITY of the components. If, however, any required component is inoperable, then it must be restored to OPERABLE status. In this case, a surveillance may need to be performed to restore the component to OPERABLE status. Actions must continue until all required components are OPERABLE.

SURVEILLANCE REQUIREMENTS

SR 3.9.7.1

Verifying the correct alignment for manual, power operated, and automatic valves in the RHR shutdown cooling flow path provides assurance that the proper flow paths will exist for RHR operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these were verified to be in the correct position prior to locking, sealing, or securing. A valve that can be manually (from the control room or locally) aligned is allowed to be in a non-RHR shutdown cooling position provided the valve can be repositioned. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

The 31 day Frequency of this SR was derived from the Inservice Testing Program requirements for performing valve testing at least once every 92 days. The Frequency of 31 days is further justified because the valves are operated under procedural control. This Frequency has been shown to be acceptable through operating experience.

REFERENCES

1. UFSAR, Section 16.6.

2. 10 CFR 50.36(c)(2)(ii).

# JAFNPP

IMPROVED STANDARD TECHNICAL
SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.8

### Residual Heat Removal (RHR) Low Water Level

MARKUP OF CURRENT TECHNICAL SPECIFICATIONS (CTS)

DISCUSSION OF CHANGES (DOCs) TO THE CTS

NO SIGNIFICANT HAZARDS CONSIDERATION (NSHC) FOR LESS RESTRICTIVE CHANGES

MARKUP OF NUREG-1433, REVISION 1, SPECIFICATION

JUSTIFICATION FOR DIFFERENCES (JFDs) FROM NUREG-1433, REVISION 1
MARKUP OF NUREG-1433, REVISION 1, BASES

JUSTIFICATION FOR DIFFERENCES (JFDs) FROM NUREG-1433, REVISION 1, BASES

RETYPED PROPOSED IMPROVED TECHNICAL SPECIFICATIONS (ITS) AND BASES

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.8

## Residual Heat Removal (RHR) Low Water Level

## MARKUP OF CURRENT TECHNICAL SPECIFICATIONS (CTS)

Insert New Specification 3.9.8

Insert new Specification 3.9.8, "Residual Heat Removal (RHR) - Low Water Level," as shown in the JAFNPP Improved Technical Specifications.

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.8

### Residual Heat Removal (RHR) Low Water Level

## DISCUSSION OF CHANGES (DOCs) TO THE CTS

ADMINISTRATIVE CHANGES

None

TECHNICAL CHANGES - MORE RESTRICTIVE

M1 A new Specification for the RHR shutdown cooling (SDC) subsystems in MODE 5 is proposed to be added as ITS 3.9.8. This Specification requires that two RHR shutdown cooling subsystems be Operable in MODE 5 with water level < 22 ft 2 inches above the top of the RPV flange. The Required Actions for an inoperable RHR SDC subsystem are to verify an alternate method of decay heat removal within 1 hour (for each inoperable RHR shutdown cooling subsystem) and every 24 hours thereafter, or to immediately initiate action to restore secondary containment, one Standby Gas Treatment (SGT) subsystem, and isolation capability in each required secondary containment flow path not isolated. The associated Surveillance Requirement is to verify each RHR shutdown cooling subsystem valve lineup every 31 days. This proposed Specification satisfies Criterion 4 of 10 CFR 50.36(c)(2)(ii) and constitutes a more restrictive change.

TECHNICAL CHANGES - LESS RESTRICTIVE (GENERIC)

None

TECHNICAL CHANGES - LESS RESTRICTIVE (SPECIFIC)

None

TECHNICAL CHANGES - RELOCATIONS

None

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

**ITS: 3.9.8**

Residual Heat Removal (RHR) Low Water Level

## NO SIGNIFICANT HAZARDS CONSIDERATION (NSHC) FOR LESS RESTRICTIVE CHANGES

TECHNICAL CHANGES - LESS RESTRICTIVE (SPECIFIC)

There are no plant specific less restrictive changes identified for this Specification.

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.8

## Residual Heat Removal (RHR) Low Water Level

## MARKUP OF NUREG-1433, REVISION 1 SPECIFICATION

PAI

## 3.9 REFUELING OPERATIONS

### 3.9.~~9~~ 8 Residual Heat Removal (RHR)—Low Water Level

PAI

[M1] LCO 3.9.~~9~~ 8 Two RHR shutdown cooling subsystems shall be OPERABLE. ~~and one RHR shutdown cooling subsystem shall be in operation.~~ CLB1

~~-------------------------------NOTE-------------------------------~~
~~The required operating shutdown cooling subsystem may be removed from operation for up to 2 hours per 8 hour period.~~
~~------------------------------------------------------------------~~

[M1] APPLICABILITY: MODE 5 with irradiated fuel in the reactor pressure vessel (RPV) and the water level < ~~[23]~~ 22 ft 2 inches above the top of the ~~[~~RPV flange~~]~~. DB1

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| [M1] A. One or two required RHR shutdown cooling subsystems inoperable. | A.1 | Verify an alternate method of decay heat removal is available for each inoperable required RHR shutdown cooling subsystem. | 1 hour<br><br>AND<br><br>Once per 24 hours thereafter |
| [M1] B. Required Action and associated Completion Time of Condition A not met. | B.1<br><br>AND | Initiate action to restore ~~[~~secondary~~]~~ containment to OPERABLE status. DB1 | Immediately<br><br>(continued) |



Typ All Pages

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| B. (continued) | B.2 Initiate action to restore one standby gas treatment subsystem to OPERABLE status. | Immediately |
| | AND | |
| | B.3 Initiate action to restore isolation capability in each required [secondary] containment penetration flow path not isolated. | Immediately |
| C. No RHR shutdown cooling subsystem in operation. | C.1 Verify reactor coolant circulation by an alternate method. | 1 hour from discovery of no reactor coolant circulation<br>AND<br>Once per 12 hours thereafter |
| | AND | |
| | C.2 Monitor reactor coolant temperature. | Once per hour |

DB1

CLB1

CLB1

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | FREQUENCY |
|---|---|
| [M1] SR 3.9.~~9~~.1 6 PA1 Verify ~~one~~ each RHR shutdown cooling subsystem ~~is operating~~ manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, is aligned or can be aligned to its correct position. CLB1 | ~~12 hours~~ 31 days CLB1 |

# JAFNPP

**IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION**

**ITS: 3.9.8**

**Residual Heat Removal (RHR) Low Water Level**

**JUSTIFICATION FOR DIFFERENCES (JFDs) FROM NUREG-1433, REVISION 1**

RETENTION OF EXISTING REQUIREMENT (CLB)

CLB1 ISTS 3.9.9 (ITS 3.9.8) requirements associated with an RHR shutdown cooling subsystem being in operation have been deleted. The requirement that one RHR shutdown cooling subsystem is Operable is considered acceptable. Requirements for RHR shutdown cooling subsystem operations are adequately controlled by JAFNPP plant operating procedures. The LCO, Actions and Surveillance have been revised to reflect this change. This change is necessary since at times the RHR shutdown cooling subsystem may not be required to be in operation to maintain plant operations within the allowable regions of the Reactor Coolant System (RCS) pressure and temperature (P/T) Limits curves of ITS LCO 3.4.9, "RCS Pressure and Temperature (P/T) Limits" or to maintain a comfortable environment for refueling activities. The requirements in ITS LCO 3.5.2 that two low pressure ECCS injection/spray subsystems shall be Operable in MODE 5, whenever reactor vessel water level is < 22 ft 2 inches below the top of the reactor pressure vessel flange, will help ensure adequate coolant inventory and sufficient heat removal capability is available to ensure the reactor vessel water level Safety Limit is not exceeded.

PLANT-SPECIFIC WORDING PREFERENCE OR MINOR EDITORIAL IMPROVEMENT (PA)

PA1 ISTS 3.9.9 has been renumbered as ITS 3.9.8 to reflect deletion of a previous Specification. The surveillances have been renumbered, where applicable to reflect this change.

PLANT-SPECIFIC DIFFERENCE IN THE DESIGN (DB)

DB1 The brackets have been removed and the proper plant specific value/nomenclature has been provided.

DIFFERENCE BASED ON AN APPROVED TRAVELER (TA)

None

DIFFERENCE BASED ON A SUBMITTED, BUT PENDING TRAVELER (TP)

None

DIFFERENCE FOR ANY REASON OTHER THAN THE ABOVE (X)

None

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.8

Residual Heat Removal (RHR) Low Water Level

## MARKUP OF NUREG-1433, REVISION 1, BASES

## B 3.9 REFUELING OPERATIONS

### B 3.9.9 Residual Heat Removal (RHR)—Low Water Level 8 PA1

BASES

**BACKGROUND**

The purpose of the Either RHR System in MODE 5 is to remove decay heat and sensible heat from the reactor coolant, as required by ~~GDC 34~~ the JAFNPP UFSAR (Ref. 1) CLB1. Each of the two shutdown cooling loops of the RHR System can provide the required decay heat removal. Each loop consists of two motor driven pumps, a heat exchanger, and associated piping and valves. Both loops have a common suction from the same recirculation loop. Each pump discharges the reactor coolant, after it has been cooled by circulation through the respective heat exchangers, to the reactor via the associated recirculation loop ~~or to the reactor via the low pressure coolant injection path~~ DB1. The RHR heat exchangers transfer heat to the RHR Service Water System. The RHR shutdown cooling mode is manually controlled. PA2 PA3

**APPLICABLE SAFETY ANALYSES**

With the ~~unit~~ plant in MODE 5, the shutdown cooling mode of the RHR System is not required to mitigate any events or accidents evaluated in the safety analyses. The RHR System is required for removing decay heat to maintain the temperature of the reactor coolant. XT

Although the RHR System ~~does not meet a specific~~ satisfies criterion 4 ~~of the NRC Policy Statement, it was identified in the NRC Policy Statement as an important contributor to risk reduction. Therefore, the RHR System is retained as a Specification.~~ 10 CFR 50.36(c)(2)(ii) (Ref. 2) X1 X1

**LCO**

In MODE 5 with irradiated fuel in the reactor pressure vessel (RPV) and the water level < ~~23~~ 22 ft 2 inches above the top of the reactor pressure vessel (RPV) flange ~~both~~ two RHR shutdown cooling subsystems must be OPERABLE. PA2 DB2 DB3 PA3

An OPERABLE RHR shutdown cooling subsystem consists of an RHR pump, a heat exchanger, an RHR service water pump capable of providing cooling to the heat exchanger, valves, piping, instruments, and controls to ensure an OPERABLE flow path. X2 To meet the LCO, ~~both~~ two RHR pumps and two RHR service water pumps in one loop or one pump and one RHR service water pump in each of the two loops must be OPERABLE. PA3 In MODE 5, the RHR cross tie valves ~~is~~ are not required to be closed; thus, the RHR valve may be opened to

(continued)

recirculation loop DB2

BASES

LCO (continued)

allow pumps in one loop to discharge through the opposite ~~loop's heat exchanger~~ to make a complete subsystem.

from the control room or locally PA2

Additionally, each RHR shutdown cooling subsystem is considered OPERABLE if it can be manually aligned (~~remote or local~~) in the shutdown cooling mode for removal of decay heat. Operation (either continuous or intermittent) of one subsystem can maintain and reduce the reactor coolant temperature as required. ~~However, to ensure adequate core flow to allow for accurate average reactor coolant temperature monitoring, nearly continuous operation is required. A Note is provided to allow a 2 hour exception to shut down the operating subsystem every 8 hours.~~ CLB2

APPLICABILITY

CLB2 2 DB3 2 inches

Two RHR shutdown cooling subsystems are required to be OPERABLE, ~~and one must be in operation~~ in MODE 5, with irradiated fuel in the RPV and with the water level < [23] ft above the top of the RPV flange, to provide decay heat removal. RHR System requirements in other MODES are covered by LCOs in Section 3.4, Reactor Coolant System (RCS)~~; Section 3.5, Emergency Core Cooling Systems (ECCS) and Reactor Core Isolation Cooling (RCIC) System; and Section 3.6, Containment Systems~~. RHR Shutdown Cooling System requirements in MODE 5 with irradiated fuel in the RPV and with the water level ≥ [23] ft above the RPV flange are given in LCO 3.9.8, "Residual Heat Removal (RHR)—High Water Level."

shutdown cooling sub PA3 sub PA4 DB3 7 PA1 2 top of the PA3 2 inches

ACTIONS

A.1

With one of the two required RHR shutdown cooling subsystems inoperable, the remaining subsystem is capable of providing the required decay heat removal. However, the overall reliability is reduced. Therefore ~~an alternate~~ method of decay heat removal must be provided. With both required RHR shutdown cooling subsystems inoperable, an alternate method of decay heat removal must be provided in addition to that provided for the initial RHR shutdown cooling subsystem inoperability. This re-establishes backup decay heat removal capabilities, similar to the requirements of the LCO. The 1 hour Completion Time is based on the decay heat removal function and the probability of a loss of the

1 PA5

(continued)

BASES

ACTIONS

A.1 (continued)

available decay heat removal capabilities. Furthermore, verification of the functional availability of this alternate method(s) must be reconfirmed every 24 hours thereafter. This will ensure continued heat removal capability. (PA5)

Alternate decay heat removal methods are available to the operators for review and preplanning in the ~~unit's~~ plant (PA2) Operating Procedures. The required cooling capacity of the alternate method should be ensured by verifying (by calculation or demonstration) its capacity to maintain or reduce temperature. (PA3) For example, this may include the use of the Spent Fuel Pool Cooling System and the Reactor Water Cleanup System, operating with the regenerative heat exchanger bypassed or in combination with the Control Rod Drive System or Condensate System (DB4). The method used to remove decay heat should be the most prudent choice based on ~~unit~~ plant (PA2) conditions.

Insert A.1-1 (PA3)

B.1, B.2, and B.3

With the required decay heat removal subsystem(s) inoperable and the required alternate method(s) of decay heat removal not available in accordance with Required Action A.1, additional actions are required to minimize any potential fission product release to the environment. This includes ensuring secondary containment is OPERABLE; one standby gas treatment subsystem is OPERABLE; and secondary containment isolation capability is available (PA3) (i.e., one secondary containment isolation valve and associated instrumentation are OPERABLE or ~~other~~ acceptable administrative controls ~~to~~ assure isolation capability) in each associated penetration flow path (PA3) not isolated that is assumed to be isolated to mitigate radioactive releases. Insert B.1, B.2 and B.3 (PA3) This may be performed as an administrative check, by examining logs or other information to determine whether the components are out of service for maintenance or other reasons. It is not necessary to perform the Surveillances needed to demonstrate the OPERABILITY of the components. If, however, any required component is inoperable, then it must be restored to OPERABLE status. In this case, the surveillance may need to be performed to restore the component to OPERABLE status. Actions must continue until all required components are OPERABLE.

(continued)

PA3

INSERT A.1-2

Decay heat removal by ambient losses can be considered as, or contributing to, the alternate method capability.

PA3

INSERT B.1, B.2 and B.3

. These administrative controls consist of stationing an operator, who is in continuous communication with the control room, at the controls of the isolation device. In this way, the penetration can be rapidly isolated when a need for secondary containment is indicated

BASES

ACTION (continued)

~~C.1 and C.2~~

~~If no RHR subsystem is in operation, an alternate method of coolant circulation is required to be established within 1 hour. The Completion Time is modified such that the 1 hour is applicable separately for each occurrence involving a loss of coolant circulation.~~

~~During the period when the reactor coolant is being circulated by an alternate method (other than by the required RHR Shutdown Cooling System), the reactor coolant temperature must be periodically monitored to ensure proper functioning of the alternate method. The once per hour Completion Time is deemed appropriate.~~ CLB2

SURVEILLANCE REQUIREMENTS

SR 3.9.8 9.1 PA1

~~This Surveillance demonstrates that one RHR shutdown cooling subsystem is in operation and circulating reactor coolant. The required flow rate is determined by the flow rate necessary to provide sufficient decay heat removal capability.~~

Insert SR 3.9.8.1 CLB1

~~The Frequency of 12 hours is sufficient in view of other visual and audible indications available to the operator for monitoring the RHR subsystems in the control room.~~ PA3

REFERENCES

None.

1. UFSAR Section 16.6 CLB1
2. 10 CFR 50.36(c)(2)(ii) X1

CLB1

## INSERT SR 3.9.8.1

Verifying the correct alignment for manual, power operated, and automatic valves in the RHR shutdown cooling flow paths provides assurance that the proper flow paths will exist for RHR operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these were verified to be in the correct position prior to locking, sealing, or securing. A valve that can be manually (from the control room or locally) aligned is allowed to be in a non-RHR shutdown cooling position provided the valve can be repositioned. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

The 31 day Frequency of this SR was derived from the Inservice Testing Program requirements for performing valve testing at least once every 92 days. The Frequency of 31 days is further justified because the valves are operated under procedural control. This Frequency has been shown to be acceptable through operating experience.

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.8

## Residual Heat Removal (RHR) Low Water Level

## JUSTIFICATION FOR DIFFERENCES (JFDs) FROM NUREG-1433, REVISION 1, BASES

JUSTIFICATION FOR DIFFERENCES FROM NUREG-1433, REVISION 1
ITS BASES: 3.9.8 - RESIDUAL HEAT REMOVAL (RHR) – LOW WATER LEVEL

<u>RETENTION OF EXISTING REQUIREMENT</u> (CLB)

CLB1 JAFNPP was designed and under construction prior to the promulgation of Appendix A to 10 CFR 50 - General Design Criteria for Nuclear Power Plants. The JAFNPP Construction Permit was issued on May 20, 1970. The proposed General Design Criteria (GDC) were published in the Federal Register on July 11, 1967 (32 FR 10213) and became effective on February 20, 1971 (32 FR 3256). UFSAR, Section 16.6 - Conformance to AEC Design Criteria, describes the JAFNPP current licensing basis with regard to the GDC. ISTS statements concerning the GDC are modified in the ITS to reference UFSAR, Section 16.6.

CLB2 ISTS 3.9.9 (ITS 3.9.8) requirements associated with an RHR shutdown cooling subsystem being in operation have been deleted. The requirement that one RHR shutdown cooling subsystem is Operable is considered acceptable. Requirements for RHR shutdown cooling subsystem operations are adequately controlled by JAFNPP plant operating procedures. The LCO, Actions and Surveillance have been revised to reflect this change. This change is necessary since at times the RHR shutdown cooling subsystem may not be required to be in operation to maintain plant operations within the allowable regions of the Reactor Coolant System (RCS) pressure and temperature (P/T) Limits curves of ITS LCO 3.4.9, "RCS Pressure and Temperature (P/T) Limits" or to maintain a comfortable environment for refueling activities. The requirements in ITS LCO 3.5.2 that two low pressure ECCS injection/spray subsystems shall be Operable in MODE 5, whenever reactor vessel water level is < 22 ft 2 inches below the top of the reactor pressure vessel flange, will help ensure adequate coolant inventory and sufficient heat removal capability is available to ensure the reactor vessel water level Safety Limit is not exceeded. The Bases has been changed to reflect this modification to the Specification.

<u>PLANT-SPECIFIC WORDING PREFERENCE OR MINOR EDITORIAL IMPROVEMENT</u> (PA)

PA1 ISTS 3.9.9 has been renumbered as ITS 3.9.8 to reflect deletion of a previous Specification. The surveillances have been renumbered, where applicable to reflect this change.

PA2 Editorial change made with no change in intent.

PA3 Editorial change made for enhanced clarity or to be consistent with similar statements in other places in the Bases.

PA4 RHR shutdown cooling subsystem requirements, which are what this Specification governs, are not covered in other MODES in Sections 3.5 or 3.6. Therefore, this statement has been deleted.

PLANT-SPECIFIC WORDING PREFERENCE OR MINOR EDITORIAL IMPROVEMENT (PA)

(continued)

PA5 Typographical/grammatical error corrected.

PLANT-SPECIFIC DIFFERENCE IN THE DESIGN (DB)

DB1 The specific RHR shutdown cooling mode discharge pathway has been included.

DB2 The RHR pumps in one loop at JAFNPP cannot discharge to the other loops heat exchanger. In addition, the cross-tie includes two cross tie values. The correct design is included.

DB3 The brackets are removed and the proper plant specific value has been provided.

DIFFERENCE BASED ON AN APPROVED TRAVELER (TA)

None

DIFFERENCE BASED ON A SUBMITTED, BUT PENDING TRAVELER (TP)

None

DIFFERENCE FOR ANY REASON OTHER THAN THE ABOVE (X)

X1 NUREG-1433, Revision 1, Bases reference to "the NRC Policy Statement" has been replaced with 10 CFR 50.36(c)(2)(ii), in accordance with 60 FR 36953 effective August 18, 1995.

X2 RHR service water requirements have been included in the Bases of ITS 3.9.8. This information defines the minimum requirements for OPERABILITY of the RHR heat exchanger in this plant operating MODE. This ensures that the Operability of the RHR subsystem is clearly defined.

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## ITS: 3.9.8

## Residual Heat Removal (RHR) Low Water Level

## RETYPED PROPOSED IMPROVED TECHNICAL SPECIFICATIONS (ITS) AND BASES

# 3.9 REFUELING OPERATIONS

## 3.9.8 Residual Heat Removal (RHR) – Low Water Level

LCO 3.9.8 Two RHR shutdown cooling subsystems shall be OPERABLE.

APPLICABILITY: MODE 5 with irradiated fuel in the reactor pressure vessel (RPV) and the water level < 22 ft 2 inches above the top of the RPV flange.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or two required RHR shutdown cooling subsystems inoperable. | A.1 Verify an alternate method of decay heat removal is available for each inoperable required RHR shutdown cooling subsystem. | 1 hour<br><u>AND</u><br>Once per 24 hours thereafter |
| B. Required Action and associated Completion Time of Condition A not met. | B.1 Initiate action to restore secondary containment to OPERABLE status. | Immediately |
| | <u>AND</u> | |
| | B.2 Initiate action to restore one standby gas treatment subsystem to OPERABLE status. | Immediately |
| | <u>AND</u> | |

(continued)

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| B. (continued) | B.3 Initiate action to restore isolation capability in each required secondary containment penetration flow path not isolated. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.9.8.1 | Verify each RHR shutdown cooling subsystem manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, is aligned or can be aligned to its correct position. | 31 days |

# B 3.9 REFUELING OPERATIONS

## B 3.9.8 Residual Heat Removal (RHR) – Low Water Level

BASES

### BACKGROUND

The purpose of the RHR System in MODE 5 is to remove decay heat and sensible heat from the reactor coolant, as required by the JAFNPP UFSAR (Ref. 1). Either of the two shutdown cooling loops of the RHR System can provide the required decay heat removal. Each loop consists of two motor driven pumps, a heat exchanger, and associated piping and valves. Both loops have a common suction from the same recirculation loop. Each pump discharges the reactor coolant, after it has been cooled by circulation through the respective heat exchangers, to the reactor via the associated recirculation loop. The RHR heat exchangers transfer heat to the RHR Service Water System. The RHR shutdown cooling mode is manually controlled.

### APPLICABLE SAFETY ANALYSES

With the plant in MODE 5, the RHR shutdown cooling mode of the RHR System is not required to mitigate any events or accidents evaluated in the safety analyses. The RHR shutdown cooling System is required for removing decay heat to maintain the temperature of the reactor coolant.

The RHR shutdown cooling mode of the RHR System satisfies Criterion 4 of 10 CFR 50.36(c)(2)(ii) (Ref. 2).

### LCO

In MODE 5 with irradiated fuel in the reactor pressure vessel (RPV) and the water level < 22 ft 2 inches above the top of the reactor pressure vessel (RPV) flange two RHR shutdown cooling subsystems must be OPERABLE.

An OPERABLE RHR shutdown cooling subsystem consists of an RHR pump, a heat exchanger, an RHR service water pump capable of providing cooling to the heat exchanger, valves, piping, instruments, and controls to ensure an OPERABLE flow path. To meet the LCO, two RHR pumps and two RHR service water pumps in one loop or one RHR pump and one RHR service water pump in each of the two loops must be OPERABLE. In MODE 5, the RHR cross tie valves are not required to be

(continued)

BASES

LCO (continued)

closed; thus, the valves may be opened to allow pumps in one loop to discharge through the opposite recirculation loop to make a complete subsystem.

Additionally, each RHR shutdown cooling subsystem is considered OPERABLE if it can be manually aligned (from the control room or locally) in the shutdown cooling mode for removal of decay heat. Operation (either continuous or intermittent) of one subsystem can maintain and reduce the reactor coolant temperature as required.

APPLICABILITY

Two RHR shutdown cooling subsystems are required to be OPERABLE in MODE 5, with irradiated fuel in the RPV and with the water level < 22 ft 2 inches above the top of the RPV flange, to provide decay heat removal. RHR shutdown cooling subsystem requirements in other MODES are covered by LCOs in Section 3.4, Reactor Coolant System (RCS). RHR shutdown cooling subsystem requirements in MODE 5 with irradiated fuel in the RPV and with the water level ≥ 22 ft 2 inches above the top of the RPV flange are given in LCO 3.9.7, "Residual Heat Removal (RHR) – High Water Level."

ACTIONS

A.1

With one of the two required RHR shutdown cooling subsystems inoperable, the remaining subsystem is capable of providing the required decay heat removal. However, the overall reliability is reduced. Therefore, an alternate method of decay heat removal must be provided. With both required RHR shutdown cooling subsystems inoperable, an alternate method of decay heat removal must be provided in addition to that provided for the initial RHR shutdown cooling subsystem inoperability. This re-establishes backup decay heat removal capabilities, similar to the requirements of the LCO. The 1 hour Completion Time is based on the decay heat removal function and the probability of a loss of the available decay heat removal capabilities. Furthermore, verification of the functional availability of this alternate method must be reconfirmed every 24 hours thereafter. This will ensure continued heat removal capability.

(continued)

BASES

ACTIONS

A.1 (continued)

Alternate decay heat removal methods are available to the operators for review and preplanning in the plant Operating Procedures. The required cooling capacity of the alternate method should be ensured by verifying (by calculation or demonstration) its capacity to maintain or reduce temperature. For example, this may include the use of the Spent Fuel Pool Cooling System and the Reactor Water Cleanup System, operating with the regenerative heat exchanger bypassed or in combination with the Control Rod Drive System or Condensate System. The method used to remove decay heat should be the most prudent choice based on plant conditions. Decay heat removal by ambient losses can be considered as, or contributing to, the alternate method capability.

B.1, B.2, and B.3

With the required decay heat removal subsystem(s) inoperable and the required alternate method(s) of decay heat removal not available in accordance with Required Action A.1, additional actions are required to minimize any potential fission product release to the environment. This includes ensuring secondary containment is OPERABLE; one standby gas treatment subsystem is OPERABLE; and secondary containment isolation capability is available in each associated penetration flow path not isolated that is assumed to be isolated to mitigate radioactive releases (i.e., one secondary containment isolation valve and associated instrumentation are OPERABLE or acceptable administrative controls assure isolation capability. These administrative controls consist of stationing an operator, who is in continuous communication with the control room, at the controls of the isolation device. In this way, the penetration can be rapidly isolated when a need for secondary containment is indicated). This may be performed as an administrative check, by examining logs or other information to determine whether the components are out of service for maintenance or other reasons. It is not necessary to perform the Surveillances needed to demonstrate the OPERABILITY of the components. If, however, any required component is inoperable, then it must be restored to OPERABLE status. In this case, the surveillance may need to be performed to restore the component to OPERABLE status.

(continued)

BASES

ACTIONS

B.1, B.2, and B.3 (continued)

Actions must continue until all required components are OPERABLE.

SURVEILLANCE REQUIREMENTS

SR 3.9.8.1

Verifying the correct alignment for manual, power operated, and automatic valves in the RHR shutdown cooling flow paths provides assurance that the proper flow paths will exist for RHR operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these were verified to be in the correct position prior to locking, sealing, or securing. A valve that can be manually (from the control room or locally) aligned is allowed to be in a non-RHR shutdown cooling position provided the valve can be repositioned. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

The 31 day Frequency of this SR was derived from the Inservice Testing Program requirements for performing valve testing at least once every 92 days. The Frequency of 31 days is further justified because the valves are operated under procedural control. This Frequency has been shown to be acceptable through operating experience.

REFERENCES

1. UFSAR, Section 16.6.

2. 10 CFR 50.36(c)(2)(ii).

# JAFNPP

**IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION**

## NUREG: N3.9.7

**[Reactor Pressure Vessel (RPV)] Water Level New Fuel or Control Rods**

## THIS SPECIFICATION IS DELETED.

THERE ARE NO REQUIREMENTS FOR THIS SPECIFICATION AT JAFNPP; THEREFORE THIS MARKUP PACKAGE CONTAINS ONLY THE FOLLOWING SECTIONS:

**MARKUP OF NUREG-1433, REVISION 1, SPECIFICATION**

**JUSTIFICATION FOR DIFFERENCES (JFDs) FROM NUREG-1433, REVISION 1**

**MARKUP OF NUREG-1433, REVISION 1, BASES**

**JUSTIFICATION FOR DIFFERENCES (JFDs) FROM NUREG-1433, REVISION 1, BASES**

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## NUREG: N3.9.7

### [Reactor Pressure Vessel (RPV)] Water Level New Fuel or Control Rods

## MARKUP OF NUREG-1433, REVISION 1 SPECIFICATION

X1



## 3.9 REFUELING OPERATIONS

### 3.9.7 [Reactor Pressure Vessel (RPV)] Water Level—New Fuel or Control Rods

LCO 3.9.7 [RPV] water level shall be ≥ [23] ft above the top of irradiated fuel assemblies seated within the [RPV].

APPLICABILITY: During movement of new fuel assemblies or handling of control rods within the [RPV], when irradiated fuel assemblies are seated within the [RPV].

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. [RPV] water level not within limit. | A.1 Suspend movement of fuel assemblies and handling of control rods within the [RPV]. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | FREQUENCY |
|---|---|
| SR 3.9.7.1 Verify [RPV] water level is ≥ [23] ft above the top of irradiated fuel assemblies seated within the [RPV]. | 24 hours |

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## NUREG: N3.9.7

[Reactor Pressure Vessel (RPV)] Water Level New Fuel or Control Rods

## JUSTIFICATION FOR DIFFERENCES (JFDs) FROM NUREG-1433, REVISION 1

JUSTIFICATION FOR DIFFERENCES FROM NUREG-1433, REVISION 1
NUREG: 3.9.7 - REACTOR PRESSURE VESSEL (RPV) WATER LEVEL—NEW FUEL OR CONTROL RODS

<u>RETENTION OF EXISTING REQUIREMENT</u> (CLB)

None

<u>PLANT-SPECIFIC WORDING PREFERENCE OR MINOR EDITORIAL IMPROVEMENT</u> (PA)

None

<u>PLANT-SPECIFIC DIFFERENCE IN THE DESIGN</u> (DB)

None

<u>DIFFERENCE BASED ON AN APPROVED TRAVELER</u> (TA)

None

<u>DIFFERENCE BASED ON A SUBMITTED, BUT PENDING TRAVELER</u> (TP)

None

<u>DIFFERENCE FOR ANY REASON OTHER THAN THE ABOVE</u> (X)

X1 ISTS 3.9.7 will not be included in the JAFNPP ITS. Therefore during the movement of irradiated fuel assemblies within the Reactor Pressure Vessel (RPV) or during the movement of new fuel assemblies or handling of control rods within the RPV when irradiated fuel assemblies are seated within the RPV, the RPV Water Level will be maintained 22 feet 2 inches above the top of the RPV flange in accordance with ITS 3.9.6, "Reactor Pressure Vessel (RPV) Water Level". The allowances in ISTS 3.9.7 are not necessary since JAFNPP outages are planned in such a way that all these operations are performed at a high water level. Although the safety analyses will support the allowances provided in ISTS 3.9.7, the proposed method of operation is conservative.

# JAFNPP

## IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION

## NUREG: N3.9.7

### [Reactor Pressure Vessel (RPV)] Water Level New Fuel or Control Rods

## MARKUP OF NUREG-1433, REVISION 1, BASES

(X1)

## B 3.9 REFUELING OPERATIONS

### B 3.9.7 Reactor Pressure Vessel (RPV) Water Level—New Fuel or Control Rods

BASES

**BACKGROUND**

The movement of new fuel assemblies or handling of control rods within the RPV when fuel assemblies seated within the reactor vessel are irradiated requires a minimum water level of [23] ft above the top of irradiated fuel assemblies seated within the RPV. During refueling, this maintains a sufficient water level above the irradiated fuel. Sufficient water is necessary to retain iodine fission product activity in the water in the event of a fuel handling accident (Refs. 1 and 2). Sufficient iodine activity would be retained to limit offsite doses from the accident to ≤ 25% of 10 CFR 100 limits, as provided by the guidance of Reference 3.

**APPLICABLE SAFETY ANALYSES**

During movement of new fuel assemblies or handling of control rods over irradiated fuel assemblies, the water level in the RPV is an initial condition design parameter in the analysis of a fuel handling accident in containment postulated by Regulatory Guide 1.25 (Ref. 1). A minimum water level of [23] ft (Regulatory Position C.1.c of Ref. 1) allows a decontamination factor of 100 (Regulatory Position C.1.g of Ref. 1) to be used in the accident analysis for iodine. This relates to the assumption that 99% of the total iodine released from the pellet to cladding gap of all the dropped fuel assembly rods is retained by the water. The fuel pellet to cladding gap is assumed to contain 10% of the total fuel rod iodine inventory (Ref. 1).

Analysis of the fuel handling accident inside containment is described in Reference 2. With a minimum water level of [23] ft and a minimum decay time of 24 hours prior to fuel handling, the analysis and test programs demonstrate that the iodine release due to a postulated fuel handling accident is adequately captured by the water and that offsite doses are maintained within allowable limits (Ref. 4).

The related assumptions include the worst case dropping of an irradiated fuel assembly onto the reactor core loaded with irradiated fuel assemblies.

(continued)

X1

BASES

APPLICABLE SAFETY ANALYSES (continued)

RPV water level satisfies Criterion 2 of the NRC Policy Statement.

LCO

A minimum water level of [23] ft above the top of irradiated fuel assemblies seated within the RPV flange is required to ensure that the radiological consequences of a postulated fuel handling accident are within acceptable limits, as provided by the guidance of Reference 3.

APPLICABILITY

LCO 3.9.7 is applicable when moving new fuel assemblies or handling control rods (i.e., movement with other than the normal control rod drive) over irradiated fuel assemblies seated within the RPV. The LCO minimizes the possibility of a fuel handling accident in containment that is beyond the assumptions of the safety analysis. If irradiated fuel is not present within the RPV, there can be no significant radioactivity release as a result of a postulated fuel handling accident. Requirements for fuel handling accidents in the spent fuel storage pool are covered by LCO 3.7.8, "Spent Fuel Storage Pool Water Level." Requirements for handling irradiated fuel over the RPV are covered by LCO 3.9.6, "[Reactor Pressure Vessel (RPV)] Water Level [—Irradiated Fuel]."

ACTIONS

A.1

If the water level is < [23] ft above the top of irradiated fuel assemblies seated within the RPV, all operations involving movement of new fuel assemblies and handling of control rods within the RPV shall be suspended immediately to ensure that a fuel handling accident cannot occur. The suspension of fuel movement and control rod handling shall not preclude completion of movement of a component to a safe position.

(continued)

X1



BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.9.7.1

Verification of a minimum water level of [23] ft above the top of irradiated fuel assemblies seated within the RPV ensures that the design basis for the postulated fuel handling accident analysis during refueling operations is met. Water at the required level limits the consequences of damaged fuel rods, which are postulated to result from a fuel handling accident in containment (Ref. 2).

The Frequency of 24 hours is based on engineering judgment and is considered adequate in view of the large volume of water and the normal procedural controls on valve positions, which make significant unplanned level changes unlikely.

REFERENCES

1. Regulatory Guide 1.25, March 23, 1972.
2. FSAR, Section [15.1.41].
3. NUREG-0800, Section 15.7.4.
4. 10 CFR 100.11.

# JAFNPP

**IMPROVED STANDARD TECHNICAL SPECIFICATIONS (ISTS) CONVERSION**

## NUREG: N3.9.7

**[Reactor Pressure Vessel (RPV)] Water Level New Fuel or Control Rods**

**JUSTIFICATION FOR DIFFERENCES (JFDs) FROM NUREG-1433, REVISION 1, BASES**

JUSTIFICATION FOR DIFFERENCES FROM NUREG-1433, REVISION 1
NUREG BASES: 3.9.7 - REACTOR PRESSURE VESSEL (RPV) WATER LEVEL—NEW FUEL OR CONTROL RODS

RETENTION OF EXISTING REQUIREMENT (CLB)

None

PLANT-SPECIFIC WORDING PREFERENCE OR MINOR EDITORIAL IMPROVEMENT (PA)

None

PLANT-SPECIFIC DIFFERENCE IN THE DESIGN (DB)

None

DIFFERENCE BASED ON AN APPROVED TRAVELER (TA)

None

DIFFERENCE BASED ON A SUBMITTED, BUT PENDING TRAVELER (TP)

None

DIFFERENCE FOR ANY REASON OTHER THAN THE ABOVE (X)

X1 ISTS 3.9.7 will not be included in the JAFNPP ITS. Therefore during the movement of irradiated fuel assemblies within the Reactor Pressure Vessel (RPV) or during the movement of new fuel assemblies or handling of control rods within the RPV when irradiated fuel assemblies are seated within the RPV, the RPV Water Level will be maintained 22 feet 2 inches above the top of the RPV flange in accordance with ITS 3.9.6, "Reactor Pressure Vessel (RPV) Water Level". The allowances in ISTS 3.9.7 are not necessary since JAFNPP outages are planned in such a way that all these operations are performed at a high water level. Although the safety analyses will support the allowances provided in ISTS 3.9.7, the proposed method of operation is conservative.